

## THE CONVULVULACEAE OF MALAYSIA, II <sup>1)</sup>

by

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The genera *Jacquemontia*, *Aniseia*, *Convolvulus*, *Calystegia*,  
*Shuterea*, *Merremia*, *Operculina* and *Decalobanthus*.

This is the second contribution to a series of papers dealing with the *Convolvulaceae* of Malaysia (Malay Peninsula and Archipelago, Philippine Islands and New Guinea). The genera worked out here belong to the tribe *Convolvuleae*; they are numbered VIII—XV. Genus VII, *Erycibe*, belonging to the *Erycibeeae* shall be treated afterwards in a special monograph.

With regard to the geographic arrangement of the specimens mentioned, some alterations had to be introduced due to the new limitation of the residencies in the island of Java. The names and limits of these residencies are now brought into line with the data of the "Atlas van Tropisch Nederland" <sup>2)</sup>.

### VIII. JACQUEMONTIA CHOISY

CHOISY in Mém. Soc. Phys. Genève VI (1833) p. 476; id. in DC., Prodr. IX (1845) p. 396; BENTH. et Hook., Gen. Plant. II (1876) p. 874; BAILL., Hist. Pl. X (1891) p. 324; PETER in ENGL.-PRANTL, Nat. Pfl. fam. IV, 3a (1891) p. 33; HALL.f. in ENGL., Bot. Jahrb. XVI (1893) p. 578; BOERL., Handl. Fl. Ned. Ind. II (1899) p. 498, 508; BAKER and RENDLE in THIS-DYER, Fl. Trop. Afr. IV, 2 (1905) p. 85; PRAIN in Journ. As. Soc. Bengal LXXIV (1906) p. 301; KOORDERS, Exk. fl. Java III (1912) p. 110; RIDLEY, Fl. Mal. Penins. II (1923) p. 456; MERRILL,

<sup>1)</sup> Part I in *Blumea* III (1938) p. 62—94.

<sup>2)</sup> *Atlas van Tropisch Nederland*, edited by the "Koninklijk Nederlandsch Aardrijkskundig Genootschap" (Royal Netherlands Geographic Society) and the "Topografische Dienst in Nederlandsch-Indië" (Topographical Service in the Netherlands Indies), 1938.

Enum. Philipp. Fl. Pl. III (1923) p. 359; BACKER, Onkruidfl. Jav. Suikerrietgr. (1931) p. 513.

Herbaceous or woody twiners, rarely erect plants, generally hairy with stellate hairs, rarely glabrous. Leaves variable, often cordate at the base, entire, rarely dentate or lobed. Flowers in axillary umbel-like or capitate cymes, with or without an involucre, rarely in scorpioid cymes or solitary or in dense terminal spikes or capitules; bracts small, linear to lanceolate, or larger and foliaceous. Sepals 5, equal or more or less unequal, often with larger outer ones. Corolla medium-sized or small, funnel-shaped or campanulate, blue, lilac, pink or rarely white, with 5 distinctly limited midpetaline bands, the limb 5-toothed or nearly entire, rarely lobed. Stamens and style included. Pollen smooth. Style 1, filiform, stigmas 2, mostly elliptic or oblong and complanate, rarely linear or globose. Ovary 2-celled, 4-ovuled. Disk small or none. Fruit a globose capsule, 2-celled, 4- or 8-valved, 4- or less-seeded. Seeds smooth or minutely papillose, glabrous or velutinous, the angles often with a narrow scarious wing.

**Distribution:** The greater part of the species in tropical and subtropical America, a few species also in the tropical and subtropical parts of Africa, Asia and Australia.

**Remarks.** MEISSNER in Mart. Fl. Bras. VII (1869) subdivided the genus into 3 sections: 1. *Cymosae* MEISSN. l.c. p. 292, 294; 2. *Capitatae* MEISSN. l.c. p. 293, 302 and 3. *Anomalae (Heterogeneae)* MEISSN. l.c. p. 293, 306. A fourth section has been distinguished by the present author viz. 4. *Capituliflorae* VAN OOSTSTR. in Rec. Trav. Bot. Néerl. XXXIII (1936) p. 216. Only the *Cymosae* are represented in Malaysia.

### Key to the species.

- 1a. Sepals unequal, two inner ones shorter<sup>1)</sup>, all acute or acuminate (in one var. subobtuse). Ovary glabrous, stigmas filiform. Bracts small, 5 mm or less<sup>2)</sup>. Herbaceous twiners . . . . . 2
- b. Sepals subequal, obtuse. Ovary pilose, stigmas subglobose. Woody twiner . . . . . 3. *J. tomentella*
- 2a. Two outer sepals ovate-lanceolate to ovate, acuminate at the apex, attenuate to the base (in var. *philippinensis* the outer sepals subobtuse, cuspidate or mucronulate, not distinctly acuminate) . . . . . 1. *J. paniculata*
- b. Two outer sepals broad-ovate, acute to short-acuminate at the apex, cordate or rounded at the base . . . . . 2. *J. Zollingeri*

<sup>1)</sup> Sepals unequal, outer ones shorter, obtuse. Cultivated species . . . . .

. . . . . 5. *J. Blanchetii*

<sup>2)</sup> Bracts longer, to 10 mm. Cultivated species . . . . . 4. *J. pentantha*

1. *Jacquemontia paniculata* (BURM. f.) HALL. f. in ENGL., Bot. Jahrb. XVI (1893) p. 541; HALL. f. in ENGL., Bot. Jahrb. XVIII (1894) p. 95; id. in Bull. Herb. Boiss. V (1897) p. 382, 1010; id. in Jahrb. Hamb. Wiss. Anst. XV (1898) p. 42; SCHUM.-LAUTERB., Fl. Deutsch. Schutzgeb., Nachtr. (1905) p. 369 (*J. panniculata*); COOKE, Fl. Bombay II (1905) p. 235; BAKER and RENDLE in THIS.-DYER, Fl. Trop. Afr. IV, 2 (1905) p. 87; PRAIN in Journ. As. Soc. Bengal LXXIV (1906) p. 302; DUTHIE, Fl. Upper Ganget. Pl. II (1911) p. 107; KOORDERS, Exk. fl. Java III (1912) p. 111; KOORDERS-SCHUM., Syst. Verz. (1910—13), Conv. p. 2; MERRILL, Spec. Blanc. in Bur. of Sc. Publ. 12 (1918) p. 326; id. in Philipp. Journ. Sc. XIX (1921) p. 374; GAMBLE, Fl. Pres. Madras V (1923) p. 926; RIDLEY, Fl. Malay Penins. II (1923) p. 456; MERRILL, Enum. Philipp. Fl. Pl. III (1923) p. 359; RENDLE in Journ. Bot. LXIII, Suppl. (1925) p. 71; BACKER, Onkruidfl. Jav. Suikerrietgr. (1931) p. 513 — *Ipomoea paniculata* BURM. f., Fl. Ind. (1768) p. 50, t. 21, fig. 3 — *Convolvulus parviflorus* VAHL, Symb. Bot. III (1794) p. 29, non SAL., non DESR.; ROXB., Fl. Ind. II (1824) p. 51 (*C. parviflorus* WILLD.); BLUME, Bijdr. (1825) p. 724; ROXB., Fl. Ind. I (1832) p. 471 (*C. parviflorus* WILLD.); CHOISY in Mém. Soc. Phys. Genève VI (1833) p. 480; HASSK., Cat. bog. alt. (1844) p. 139, excl. Ip. timor.; CHOISY in DC., Prodr. IX (1845) p. 413; ZOLL., Syst. Verz., 2. Heft (1854) p. 130; MIQ., Fl. Ned. Ind. II (1857) p. 622; BENTH., Fl. Austr. IV (1869) p. 430; v. MUELLER, Descr. Notes Pap. Pl. IV (1876) p. 70; CLARKE in HOOK., Fl. Brit. Ind. IV (1883) p. 220; HEMSL., Rep. Chall. Bot. I, 3 (1884) p. 170; VIDAL, Phan. Cuming. Philipp. (1885) p. 129 (not seen); FORBES, Wander., Germ. ed., II (1886) p. 222; VIDAL, Rev. Plant. Vasc. Philipp. (1886) p. 197; WATT, Diet. Econ. Prod. II (1889) p. 519; WARB. in ENGL., Bot. Jahrb. XIII (1891) p. 412; TRIMEN, Handb. Fl. Ceyl. III (1895) p. 226; BOERL., Handl. Fl. Ned. Ind. II (1899) p. 509; SCHUM.-LAUTERB., Fl. Deutsch. Schutzgeb. (1901) p. 518; MANSON BAILEY, Queensl. Fl. IV (1901) p. 1070; id., Compr. Cat. Queensl. Pl. (1909) p. 353; GAGNEP. et COURCH. in LEC., Fl. Indo-Chine IV (1915) p. 300, fig. 35 — *Ipomoea parviflora* (VAHL) PERS., Syn. I (1805) p. 183 — *Convolvulus multivalvis* var.  $\beta$  R. Br., Fl. Nov. Holl. ed. 1 (1810) p. 483 — *Jacquemontia umbellata* BOJ., Hort. Maurit. (1837) p. 229 (not seen); CHOISY in DC., Prodr. IX (1845) p. 397; BOERL., Handl. Fl. Ned. Ind. II (1899) p. 509 — *Convolvulus valerianoides* BLANCO, Fl. Filip. (1837) p. 90<sup>1)</sup> — *C. boerhaavioides* BLANCO,

<sup>1)</sup> According to MERRILL, Spec. Blanc. (1918) p. 326.

l.c., ed. 2 (1845) p. 67 (not seen); ed. 3, I (1877) p. 125<sup>1)</sup> — *Breweria valerianoides* F.-VILL., Novis App. (1880) p. 143 (not seen)<sup>1)</sup> — *Convolvulus paniculatus* (BURM. f.) O. K., Rev. gen. pl. (1891) p. 440; BOLD., Zakfl. Java (1916) n. 801.

Herbaceous twiner, 0.25—2.00 m (BACKER), young specimens erect or decumbent. Stems terete, slender, the young parts mostly finely hairy, afterwards glabrescent, occasionally the pubescence is dense in adult specimens. Leaves petiolate, petiole slender, finely pilose, 1 to 6 cm long, the blade ovate or ovate-oblong, mostly acuminate with mucronulate tip, sometimes acute to obtuse and mucronulate, more or less cordate or rounded to truncate at the base, 2—8 cm long and 1.5—5 cm broad, glabrous or short-pilose and glabrescent above and beneath; lateral nerves 5—8, arcuately connected near the margin. Peduncles more or less pubescent, axillary, variable in length, very short and only a few mm long or longer, to several cm, the flowers in a loose to very dense, few- to many-flowered umbelliform cymose inflorescence at their end; bracts small, subulate; pedicels filiform, pubescent, 3—6 mm, or longer after flowering-time. Sepals more or less pilose or nearly glabrous, unequal, the 3 outer ones of which the third one is often more or less oblique at the base, ovate-lanceolate to ovate, acuminate to long-acuminate with more or less waved top, attenuate to the base, herbaceous or the third one with a scarious margin at one side, 5—7 mm long, the 2 inner ones shorter, with broad-ovate to orbicular base, acuminate, 3—4.5 mm long, the base with a scarious margin. Corolla funnel-shaped, 5-lobed, glabrous, or with some hairs at the mucronulate top of the lobes, lilac, pale blue, lilac with white base or white, 8—10 mm long. Stamens subequal, the filaments inserted about 1.5 mm above the corolla base, pubescent at their broadened base. Ovary ovoid, glabrous. Style filiform with two filiform stigmas. Disk ring-shaped, yellow (BACKER). Capsule globular, 3—4 mm across, brown, glabrous, 2-celled, 8-valved, the valves lanceolate, acute. Seeds 4 or less, brownish yellow to purplish black, minutely verrucose, glabrous, 1.5—2 mm long, the angles with a very narrow scarious wing.

MALAY PENINSULA, Perlis, Gua Nangka, HENDERSON, Singapore Field n. 23071, Nov. 1929 (S, mixed with *Merremia umbellata* (L.) HALL. f.); Bukit Lagi, RIDLEY 14900a, March 1910 (K, S); Kedah, P. Langkawi, Batu Ayam, Selat Panchor, c. 100 ft., on limestone, HENDERSON, Singapore Field n. 23941, Nov. 1934 (B, S); Perak, Kuala Kangsar, HANIFF, Singapore Field n. 14996, Jan. 1925 (S); Kampong Kota, WRAY Jr. 3337, Febr. 1883 (S).

<sup>1)</sup> According to MERRILL, Spec. Blanc. (1918) p. 326.

SUMATRA, without precise locality, KORTHALS 132 (L); Atjeh and Dependencies, Poeloe We, BUITENDIJK s.n., May 1914 (L); East Coast, Batoebara, YATES 2233 (B, L); West Coast, Fort van der Capellen, MATTHEW s.n., Jan. 1913 (K); Lampoengs, Gedong-tetahan, 400 ft., FORBES 1287 c (BD, L):

JAVA, according to BACKER in West and East Java in the lower parts, in fields, on shrubs and hedges. Without precise locality, BLUME s.n. (L, U); HORSFIELD s.n. (L, U); NAGEL or NAGLER 181 (BD); PLOEM s.n. (B); Bantam, above Lebak, KUIIL and VAN HASSELT 76, Aug. (L); Tjilangkahan, HASSKARL s.n. (L); between Pasir Ajoenam and Tjipanas, c. 200 m, BACKER 2018, June 1911 (B); Batavia, Batavia, BLUME 1169 (L); beach near Pakapoeran, SCHEFFER s.n., Aug. 1871 (B); Tandjong Priok, RAAP 492, June 1894 (L); id., grassy places and thickets near the beach, HALLIER s.n., Febr. 1896 (B); West of Tandjong Priok, BACKER 31815, May 1903 (B); Weltevreden, BACKER 31816, July 1903 (B); Kramat Sentiong, S. of Weltevreden, field, BACKER 31812, Oct. 1902 (B); Meester Cornelis, thickets along Kali Baroe, BACKER 31813, July 1903 (B); Bidaratjina, EDELING s.n. (B); Kebajoran, BACKER 31814, July 1904 (B); Tjikoja, BLUME s.n. (L); near Tjikoja and Lamadjang, ZOLLINGER 170 (BD); east of Pangipiran, c. 250 m, thickets, VAN STEENIS 5446, July 1933 (B); Poerwakarta, 150 m, wayside, VAN SLOOTEN 437, July 1920 (B); south of Poerwakarta, 200 m, thickets, BACKER 13827, June 1914 (B); Tjikoempai, east of Poerwakarta, c. 110 m, HARMSSEN 54, Aug. 1921 (B); id., HARMSSEN 128, Dec. 1921 (B, a cultivated specimen); Buitenzorg, cultivated in the Botanic Garden, TEYSMANN (L); id., XV. K. B. X. 7 (B); Kiara Pajoeng, north of Tjiandjoer, 500—600 m, in Hevea-plantation, ZWAARDEMAKER 87, May 1918 (B); Pelabochanratoe, BOENLAGE s.n., July (L); Priangan, Rawah Lakbok, south of Tjikawoeng, thickets, 40 m, BACKER 4325, Aug. 1912 (B); Bandar, Hevea-garden, 40 m, BACKER 4213, Aug. 1912 (B); Cheribon, between Haoergeulis and Tji-poenagara, 25 m, BACKER 16847, Oct. 1914 (B); Pekalongan, Brebes, BACKER 15346, Sept. 1914 (B); Soebah, KOORDERS 36907 $\beta$ , May 1899 (B, L); id., teak-wood, on red volcanic soil, BEUMÉE 4309, July 1919 (B); Kedoe, Gombong, VAN HARDENBERG s.n. (B); Semarang, Semarang, DE VISSER SMITS s.n. (B); Tjandi, c. 60 m, alang-field, DOOTERS VAN LEEUWEN 596, July 1912 (B); virgin forest Kerto near Kedoengdjati, KOORDERS 28094 $\beta$ , June 1897 (B); virgin forest near Kenteng, Kedoengdjati, KOORDERS 25207 $\beta$ , Sept. 1896 (B); Kedoengdjati, KOORDERS 28232 $\beta$ , June 1897 (B, L); id., KOORDERS 25354 $\beta$ , Sept. 1896 (B); Grobogan, S. Kradenan, teak-wood, c. 75 m, DE BOER 28, June (B); Randoesari, c. 15 m, dry grassy places, LÖNZING 1689, June 1914 (B); Djapara-Rembang, Ngarengan, KOORDERS 33508 $\beta$ , May 1899 (B); id., KOORDERS 33514 $\beta$ , May 1899 (B, L); id., KOORDERS 33511 $\beta$ , May 1899 (B, L); Ngawen, teak-wood, on marl, c. 100 m, BEUMÉE 5252, Aug. 1920 (B); id., BEUMÉE 5288, Aug. 1920 (B); Bekoetoeck, teak-wood, on marl, BLOKHUIS s.n., May 1918 (B); Pajaman, teak-wood, BEUMÉE 880, June 1917 (B); Padangan, teak-wood, 100 m, BEUMÉE 1006, Aug. 1917 (B); between Randoeblatoeng and Blora, 50 m, teak-wood, BLOKHUIS s.n., May 1919 (B); Soerakarta, Klaten, 180 m, LEEFMANS 135 (B); Madioen, Madioen, 60 m, WISSE 44, May 1919 (B); Ngawi, 150 m, STOUTJESDIJK 14, June 1921 (B); id., 50 m, SOERADJI 11, May 1918 (B); Soerabaja, Soerabaja, DORGELO 739, July 1922 (Pa); Wonokromo, 5 m, in thickets, VAN SLOOTEN 2062, Sept. 1928 (B); S. Soerabaja, Pakis, teak-wood on black volcanic soil, 50—100 m, BEUMÉE 2494, May 1918 (B); limestone hill near Gasari, northwest of Sidajoe, 50—100 m, DORGELO 2129, Sept. 1923 (B); Malang,

Paseroean, BACKER 37034, May 1930 (Pa); Soemberwalo, 500 m, BACKER 3515, May 1912 (B); Bantoer, 300 m, BACKER 3855 (B); between Jasawilangoen and Tempoeran, 20 m, on hedges, BACKER 8018, May 1913 (B, L); Bangil, thickets, 5 m, BACKER 7595, May 1913 (B); Kepoeh, in bushes, 75 m, BACKER 24215, June 1918 (B); Peteng, teak-wood, on red volcanic soil, BEUMÉE 2705, June 1918 (B); Kidoel, BUYSMAN 174, Aug. 1907 (U); Alkmaar near Lawang, MOUSSET 786 (B); Malang, c. 450 m, WISSE 220, June 1920 (B); G. Bentar near Probolinggo, 30 m, thickets on dry hill, BACKER 24320, June 1918 (B); Besoeki, N. slope of G. Idjen above Bajeman, thickets, 500 m, BACKER 24888, June 1918 (B); Sitoebondo, thickets, 30 m, BACKER 24628, June 1918 (B); Soemberwaroe, 50—150 m, KOORDERS 43882 $\beta$  (see remarks), Aug. 1916 (B, L); Soemberwaroe, Kali Kelorkoran, CLASON C 100, May 1931 (B); Glenmore, RANT 1004, May 1933 (B); near Poeger, KOORDERS 21085 $\beta$ , Oct. 1895 (B); id., KOORDERS 21463 $\beta$  (B); Madoera, Kangean-islands, Kangean, Tambajangan, 110 m, BEGUIN L 2 (see remarks), May 1919 (B); id., Paliat, on hedge, BACKER 29629 (see remarks), May 1919 (B); id., Sepandjang, thickets, BACKER 29028, Apr. 1919 (B); id., Sepapan, thickets, BACKER 28545 (see remarks), Apr. 1919 (B).

CELEBES, without precise locality, MEYER s.n. (BD); Celebes and Dependencies, Roembia, Liano, 25—150 m, ELBERT 3012, Sept. 1909 (L); Salajar islands, Salajar, TEYSMANN 13885, see remarks (B); id., Kajocadi, c. 100 m, DOCTERS VAN LEEUWEN 1330, May 1913 (U); id., Bonerate, c. 40 m, in thickets, DOCTERS VAN LEEUWEN 1435, May 1913 (B, U); P. Moena, Raha, in dry vegetation, ELBERT 2888, July 1909 (L); id., id., on dry soil, ELBERT 2931, Aug. 1909 (L); P. Boeton, Bae-bae, in thickets, on very dry soil, ELBERT 2653, Sept. 1909 (L).

BALI, G. Goendoel, v. D. PAARDT 47, June 1926 (B); Noesa Penida, between Sampelan and Tanglad, way along coast, DE VOOGD 2396, April 1936 (B); id., between Tanglad and Keloempoeh, common, 400—500 m, DE VOOGD 2438, April 1936 (B).

LOMBOK, Ekas (†), thickets, Mrs. RENSCH 391, Apr. 1927 (B); Rindjani, northern slope, Bajan, on sand, 125—225 m, ELBERT 683, Apr. 1909 (L); Rindjani, northern slope, Sadjang, 500—700 m, ELBERT 795, Apr. 1909 (L).

SOEMBABA, Dompoe, in dry thickets, Mrs. RENSCH 843, May 1927 (B); E. Soembawa, Kapenta, teak-wood, 200 m, DE VOOGD 2560, June 1936 (B).

SOEMBA, Maoemaroo, forest, IBOET 485, May 1925 (B, L).

TIMOR, without precise locality, TEYSMANN s.n. (B); a duplicate specimen from the Paris herbarium, without collector's name (BD, L); a specimen from Koepang, cultivated in the Botanic Garden at Buitenzorg, B.X.I.R. (B); Koepang, near Babaoe, ZEIJER s.n., May 1875 (BD); north coast of bay of Koepang, Taimanam, clearing in mountain forest, 1400 ft., NAUMANN s.n., May 1875 (BD, named var. *inaequalis* ENGL.); South Middle Timor, Soë, 880 m, WALSH 117, Jan. 1929 (B); id., Kolbano, WALSH 376, Apr. 1929 (B).

MOLUCCAS, Timorlaoet (according to HEMSLEY, 1884).

NEW GUINEA, Territory of New Guinea, Constantinhafen, SCHLEGELTER 14236, March 1902 (B, BD, K, P).

BISMARCK ARCHIPELAGO, New Ireland, Nusa, WARBURG 21262 (BD); id., Namatanai, Nukonuko, along-field, PEEKEL 362, March 1910 (BD).

PHILIPPINE ISLANDS, according to MERRILL on Luzon (Ilocos Norte, Lepanto, Bontoc, Union, Bulacan, Rizal, Laguna, Batangas), Culion, Palawan, Mindanao (Zamboanga) and Basilan, in thickets at low and medium altitudes. Without precise

locality, CUMING 829 (L); Luzon, CUMING 645 (BD); Prov. of Rizal, Montalban, LOHER 7281, Oct. 1903 (B, BD, K); Manila, Rev. Pl. Vasc. Filip. 476 (L); id., Antipolo, RAMOS, Bur. of Sc. 1600, Jan. 1914 (B, BD, L, P); Batangas Prov., Punta Santiago, MERRILL, Spec. Blancoanae 822, Febr. 1915 (B, BD, K, L); Zambales Prov., Anuling, RAMOS and EDAÑO, Bur. of Sc. 44603, Nov.-Dec. 1924 (S); Culion, MERRILL 540, Dec. 1902 (BD, K); Palawan, Puerto Princesa, Mt. Pulgar, ELMER 12878, March 1911 (B, L).

CHRISTMAS ISLAND, Flying fish cove toward South Point, RIDLEY 26, Oct. 1904 (S).

Distribution: Tropical East Africa, Madagascar and adjacent islands, India (Central Provinces and Bombay to S. India, Assam, Indo-China<sup>1</sup>), Ceylon, Malaysia, N. Caledonia, Tropical Australia.

Vernacular names: aroj djetang lemboet (Sund., KOORDERS), aroj djetton lemboet (Sund., MIQUEL), aroj jutton lumboet (HASSKARL), aroj pondolandak (Bantam, HASSKARL), aroj kapirotoc (Priangan, BOERLAGE), kapirotoc (Jav., Pekalongan, Djember, KOORDERS), rawatan (Jav., Semarang, KOORDERS), lawatan (Jav., Semarang, KOORDERS), oyot kitsjil (BURMAN), siemboekan (Mad., Bali, v. D. PAARDT), himag (Philipp., Panay Bisaya language, MERRILL).

Remarks. 1. The pubescence of this species differs to a great extent in various specimens. In many specimens the indument in the inflorescences is denser than in the other parts. As has been mentioned already in the description, the length of the peduncle is very variable, from only a few mm to several cm. The sepals are slightly unequal in length, the three outer ones, of which the third one is often oblique at the base, are ovate-lanceolate to ovate, acuminate at the apex, attenuate to the base. Some specimens have the sepals broader than is commonly found; they closely resemble *J. Zollingeri*. Such specimens I saw from East Java (Besoeke, KOORDERS 43882  $\beta$ ) and from the Kangean Islands (BACKER 29629, 28545, BEGUIN L 2). See also the remarks under *J. Zollingeri*.

2. A remarkable number is that collected by TEYSMANN (13885) on the island of Salajar (Celebes and Dependencies), showing an erect habit, according to the annotation on the label: "Convolvulacea erecta". It is in fruiting stage; flowers and leaves are lacking; the younger branches seem to have been densely tomentose. It might represent a

<sup>1</sup>) A specimen collected in Tonkin, Indo-China, has the flowers larger, the corolla is about 15 mm long and 20 mm broad.

Var. *grandiflora* VAN OOSTSTR., nov. var., differt corolla circ. 15 mm longa, limbo circ. 20 mm lato.

INDO-CHINA, Tonkin, vicinity of Tu-Phap, BALANSA 3539, Nov. 1888 (L, type).

distinct variety, as has been supposed already by HALLIER, who added the following identification: *Jacquemontia paniculata* HALL. f. var., but as the material is so insufficient it seems better not to give a definite opinion until better specimens are available.

var. **multivalvis** (R. Br.) VAN OOSTSTR., nov. comb. — *Convolvulus multivalvis* R. Br., Fl. Nov. Holl. ed. 1 (1810) p. 483, var.  $\alpha$ ; BENTH., Fl. Austr. IV (1869) p. 429; MANSON BAILEY, Queensl. Fl. IV (1901) p. 1070; id., Compr. Cat. Queensl. Pl. (1909) p. 353, fig. 328 — *Convolvulus parviflorus* VAHL var. *tomentosa* WARB. in ENGL., Bot. Jahrb. XVIII (1894) p. 207; SCHUM.-LAUTERB., Fl. Deutsch. Schutzgeb. (1901) p. 518 — *Jacquemontia multivalvis* (R. Br.) HALL. f. in Jahrb. Hamb. Wiss. Anst. XV (1898) p. 42; SCHUM.-LAUTERB., Fl. Deutsch. Schutzgeb., Nachtr. (1905) p. 369, with exception of the specimen SCHLECHTER 14236, which belongs to typical *J. paniculata* (BURM. f.) HALL. f.

Plant covered with a dense, yellowish brown tomentum, finally glabrescent.

TIMOR, without precise locality, ZIPPELIUS (L, labelled *Convolvulus sidaefolius* ZIPP., an unpublished name).

NEW GUINEA, Territory of New Guinea, Kelana, in fissures of rocks, prostrate, HELLWIG 48, fl. July 1888 (BD, type of *Convolvulus parviflorus* VAHL var. *tomentosa* WARB.); Papua, Port Moresby, GOLDIE (according to v. MUELLER); id., sea shore, CARR 11827, fl. April 1935 (L).

PHILIPPINE ISLANDS, Apo Island, Mindoro Straits, MERRILL 420, Dec. 1902 (BD).

Distribution: Moluccas, Philippine Islands, New Guinea, Australia (N. Australia, Queensland).

Remarks. The specimens from Timor, collected by ZIPPELIUS perhaps differ by the glabrous sepals (only seen in fruiting state).

var. **philippinensis** VAN OOSTSTR., nov. var.

Differt sepalis 3 exterioribus ellipticis vel elliptico-oblongis, obtusiusculis, cuspidatis vel mucronulatis, non distincte acuminatis, herbaceis, 2 interioribus paullo latioribus, margine scariosis; pedunculis filiformibus, tenuioribus.

PHILIPPINE ISLANDS, Luzon, prov. of Ilocos Norte, Burgos, RAMOS, Bur. of Sc. 27181, Febr.-March 1917 (B, type); prov. of Ilocos Sur, Candon, CLEMENS 18677, Nov. 1928 (B); prov. of Union, Bauang, ELMER 5733 (see remarks), Febr. 1904, (B, BD, K, L).

Distribution: Philippine Islands (Luzon).

Remarks. 1. The pubescence of this new variety rather varies in the three numbers mentioned. Whereas CLEMENS 18677 is nearly glabrous, the two other numbers are covered with a very short tomentum. This tomentum is well-developed in the young parts, afterwards it apparently disappears.



2. The specimens ELMER 5733 are not quite typical var. *philippinensis*; their peduncles are partly somewhat thicker.

2. *Jacquemontia Zollingeri* (CHOISY) HALL. f. in ENGL., Bot. Jahrb. XVI (1893) p. 543 — *Convolvulus Zollingeri* CHOISY in ZOLL., Syst. Verz., 2. Heft (1854) p. 130, 132; MIQ., Fl. Ned. Ind. II (1857) p. 622; BOERL., Handl. Fl. Ned. Ind. II (1899) p. 509.

Herbaceous twiner, lignescent in the basal parts, pubescent to short-tomentose. Stems terete, glabrescent, brownish. Leaves rather shortly petiolate, blade ovate, acute or short-acuminate, base cordate, to 5.5 cm long and to 3.5 cm broad, but often smaller, pubescent to short-tomentose; lateral nerves 7—8. Peduncles axillary, rather short, 2—15 mm, pubescent to short-tomentose, cymosely branched, few- to several-flowered; bracts subulate, the lower to 5 mm long, the upper much shorter. Sepals very unequal, the two exterior ones broad-ovate, acute to short-acuminate at the apex, cordate or rounded at the base, herbaceous, pubescent to tomentose, the third semi-ovate, acute, partly herbaceous, partly scarious, the fourth and fifth lanceolate, acute, hairy near the apex, for the rest glabrous; two exterior ones 7 mm, third 6.5 mm, fourth and fifth 4.5 mm long. Corolla pale lilac, funnel-shaped, slightly 5-lobed, glabrous, 9—11 mm long. Filaments inserted 1.5 mm above the corolla base, pubescent at the place of insertion. Style glabrous, filiform, with 2 filiform stigmas. Capsule globular, 8-valved. Seeds 4, black, minutely verrucose, glabrous, about 2 mm long, the angles with a very narrow scarious wing.

BALI, Saraja, ZOLLINGER 705, May 1845 (B, L, U).

SOEMBAWA, Bima, between Sapi and Wira, in thickets near the coast, ZOLLINGER 3422 Z. M., Oct. 1847, *type* (B, L).

TIMOR, without precise locality, DE CASTRO s.n. (B); id., only numbered 14 (B).

**Distribution:** Lesser Sunda Islands.

**Remarks.** This species seems to be very closely related to the preceding one; perhaps it would even be better to consider it merely as a variety of it. In this connection may be pointed to some specimens mentioned under *J. paniculata* from East Java and from the Kangean islands (see remarks under *J. paniculata*). *J. paniculata* and *J. Zollingeri* show a great resemblance in general habit as well as in the form and size of the leaves and the inflorescences. The main differences may be found in the form of the sepals, the two outer ones of which in *J. Zollingeri* are broad-ovate, acute to acuminate at the apex and cordate or rounded at the base. The specimens have the same short and dense tomentum as var. *multivalvis* of *Jacquemontia*

*paniculata*. It is an interesting fact that besides these tomentose specimens there is also a much less pubescent form in which the stem and leaves are only sparsely pilose and glabrescent, whereas the inflorescences still bear the dense tomentum:

var. **Jonkeri** VAN OOSTSTR., nov. var.

Differt ramis, petiolis, foliisque sparse pilosis vel glabrescentibus, pedunculis, pedicellis, calycibusque dense tomentosis.

TIMOR, without precise locality, JONKER 285, fl. Apr. (U, *type*).

Distribution: Timor.

A remarkable plant with its sparsely pilose stems and leaves and its densely tomentose inflorescences with very short peduncles (2—5 mm) and white flowers.

3. **Jacquemontia tomentella** (Miq.) HALL. f. in Versl. 's Lands Plantent. 1895 (1896) p. 126; BOERL., Handl. Fl. Ned. Ind. II (1899) p. 499, 508; HALL. f. in ENGL., Bot. Jahrb. XLIX (1913) p. 377; RENDLE in Journ. Linn. Soc. XLII (1914) p. 113; MERRILL in Journ. Roy. As. Soc. Str. Br. Spec. Numb. (1921) p. 508 — *Lettsomia tomentella* Miq., Fl. Ned. Ind. Suppl. (1860) p. 560.

A large, woody twiner. Stems terete, angular upwards, the younger parts densely puberulent with very minute stellate (7—13 rays) hairs of a pale yellow-brown colour, making the impression of being farinose; the adult parts glabrescent, fistulose, 4—5 mm in diam. Leaves petiolate, the petiole much shorter than the blade, 2—4.5 cm long, densely puberulent like stems, longitudinally grooved; the blade large, ovate, acuminate at the apex, rounded or slightly cordate at the base, 6—14 cm long and 4—9.5 cm broad, with the same farinose stellate pubescence as the stems, the lower surface paler than the upper one, the upper surface glabrescent; nervation prominent beneath, lateral nerves 6—7, secondary nerves parallel. Peduncles axillary, farinose with stellate hairs like the stems, shorter or longer than the leaves, corymbosely branched above, the flowers in dense umbel-like inflorescences, forming large, more or less unilateral panicles at the end of the branches; pedicels 3—6 mm, lower bracts sometimes foliaceous, upper ones much smaller. Sepals almost equal in length, 5—6 mm, the two outer ones ovate, obtuse, the three inner ones broad-ovate to orbicular, concave, all puberulent outside and with minute pellucid dots, inside glabrous. Corolla pink or white, funnel-shaped, with 5 densely pilose midpetaline areas, 14—15 mm long or more. Filaments with dilated, pilose base. Ovary pilose, 2-celled, each cell with 2 ovules, style filiform, pilose near the base, stigma lobes thick, almost globular, wrinkled. Capsule not seen (for the capsule see under var. *micrantha*).

SUMATRA, West Coast, Mocara Sipongi, TEYSMANN 1149 HB (B; U, *type of Lettsonia tomentella* Miq.); Bondjol, TEYSMANN 1151 HB (B, L, U); Djambi, Pahoe, on hill, c. 30 m, POSTHUMUS 1017, Oct. 1925 (B, L).

BORNEO, without precise locality, DE VRIESE 213, 1859—60 (L).

Distribution: Sumatra, Borneo.

Vernacular names: akar koemiet (Sumatra, TEYSMANN), lehoe-lehoe (Sumatra, POSTHUMUS).

Remarks. All parts of the plant are covered with a dense farinose pubescence consisting of very small scalelike stellate hairs, with 7—13 short rays. These scales give a typical pale yellowish brown colour to the specimens.

var. *micrantha* HALL. f. in ENGL., Bot. Jahrb. XLIX (1913) p. 377; MERRILL in Journ. Roy. As. Soc. Str. Br. Spec. Numb. (1921) p. 508; VAN OOSTSTR. in Kew Bull. (1938) p. 175.

Indument as in the type. Flowers smaller than in the typical specimens of the species, sepals of the same form, but shorter, 3—4 mm long, corolla 8—10 mm long, capsule ovoid, mucronate, about 8 mm high, brown, 2-celled, 4-valved, valves hairy at the top, lanceolate, acute, seeds 4 or often less, brownish black, glabrous.

BORNEO, W. division, Sintang, G. Kelam, HALLIER 2256, Jan. 1894 (B, BD, K, L); Sintang, upper Mandai River, Nanga Racoen, HALLIER 2570, March 1894 (B, L); S. and E. division, between Salinahu and Simpokak, WINKLER 2982, July 1908 (B). Cultivated in the Botanic Garden at Buitenzorg sub n. XV. H. 29 and XV. H. 32 (B); Sarawak, Sarawak river, Perkulu Ampat, Jeramé, HAVILAND b. p. r. c., June 1890 (K, *type*; S); Saribas, Paku, HAVILAND and HOSE 3519, Dec. 1893 (K, L); Baram district, Miri river, HOSE 525, Jan. 1895 (K); near Long Kapa, Mount Dulit, Ulu Tinjar, under 300 m, in secondary forest, RICHARDS 1257, Aug. 1932 (K); Kabayan-Koung, 600—1300 ft., HOLTUM, Singapore Field n. 25110; Nov. 1931 (S); British North Borneo, Tenom, 700 ft., abundant everywhere; it forms dense masses over exposed low undergrowth, which are simply smothered in delicate rose-pink flowers that contrast charmingly with the silvery green leaves, GIBBS 2717, fl. January (K); Mount Kinabalu, between Kibayo and Keung, CLEMENS 9848, Oct. 1915 (B).

Distribution: Borneo.

Vernacular names: ampur (Sintang, HALLIER), djela-ang (S. and E. division, WINKLER).

Remarks. A large liane, 9—12 m high (RICHARDS), the flowers are purple-pink (HOLTUM), pale magenta (RICHARDS), red-purple (HAVILAND), pink or white (HALLIER); anthers and stigmas are white; the leaves and the stem are whitish-green (RICHARDS); silvery green (GIBBS). See also the remarks by HALLIER l.c. p. 377—378.

var. *heteroradiata* VAN OOSTSTR., nov. var.

Var. *mieranthae* simillima, differt pilis stellatis biformibus, pluri-

bus ut in var. *micrantha*, ceteris 8—10-radiatis, radio uno quam ceteris multo longiore, erecto.

BORNEO, S. and E. division, Darat Mahakam, exped. NIEUWENHUIS, AMDJAH 33, Oct. 1898 (B; L, *type*); Soengoi Bloe-oe, exped. NIEUWENHUIS, JAHIERI 406, 1896—97 (B, L).

Distribution: Borneo.

Remarks. This new variety much resembles var. *micrantha*, differs, however, by the curious stellate hairs, being of two forms, viz. partly as in var. *micrantha* and partly with several short rays and a longer erect one, much exceeding the others.

var. *tomentosa* VAN OOSTSTR., nov. var.

Var. *micranthae* simillima, differt pilis stellatis 3—4(—5)-radiatis, radiis longioribus.

BORNEO, Sarawak, without precise locality, BECCARI 2761 (K); Sarawak river, Perkulu ampat, HAVILAND b.q.n.x, June 1890 (K); Limbang, HAVILAND b.q.m.x.b., 113, in black and 590, in red (K); Limbang, HOSE 764, Dec. 1895 (K, *type*); Trusan River, HAVILAND b.c.b.n., 832 (K).

Distribution: Borneo.

Remarks. Stellate hairs with 3—4, occasionally with 5 rays; rays longer than in var. *micrantha*, hairs often differing in size, often larger mixed with smaller ones. The indument on the lower surface of the leaves is often much denser than on the upper surface; sometimes the upper surface is almost glabrous.

Cultivated for the flowers are:

4. *J. pentantha* (JACQ.) DON. A glabrous or sparsely hairy twiner. Leaves ovate to broad-ovate, acuminate; peduncles long and slender. Flowers in a few to many-flowered umbelliform cyme; bracts much longer than in *J. paniculata*, linear, the lower ones to 10 mm long; two outer sepals 7—10 mm long, ovate, long acuminate, third sepal oblique, semi-ovate, 2 interior sepals much shorter, ovate to lanceolate, acuminate. Corolla blue, white at the base, larger than in *J. paniculata*, 1—1.5 cm long, the limb about 2 cm broad.

MALAY PENINSULA, Singapore, cultivated in the Botanic Gardens, FURTADO s.n.; MD. NUR s.n.; HULLETT 356 (S).

JAVA, Malang, Malang, cultivated, ULTÉE s.n. (B).

5. *J. Blanchetii* MORIC. A glabrous or sparsely hairy twiner. Leaves ovate or ovate-oblong, acuminate; peduncles long and slender. Flowers in few-flowered umbelliform cymes; bracts minute; sepals glabrous, two outer sepals shorter than the inner ones, ovate to elliptic, obtuse, 4—6 mm long, the 3 inner ones more oblong, obtuse, 7—7.5 mm

long. Corolla about 2.5 cm long, pale blue or violet, the midpetaline areas paler outside.

JAVA, Buitenzorg, Buitenzorg, cultivated in the Botanic Garden n. X. F. 63 (L); XV. H. 42 (B); XV. K. B. XII. 3 (B); XV. K. B. XII. 9 (B); HALLIER C. 14, March 1893 (L); Kedoe, Wonosobo, cultivated, BRINKMAN 643, July 1935 (B); Malang, Paseroean, cultivated, BACKER 36032, July 1929 (Pa).

### IX. ANISEIA CHOISY

CHOISY in Mém. Soc. Phys. Genève VI (1833) p. 481; VIII (1838) p. 65; id. in DC., Prodr. IX (1845) p. 429; MIQ., Fl. Ned. Ind. II (1857) p. 623; PETER in ENGL.-PRANTL, Nat. Pfl. fam. IV, 3a (1891) p. 25; HALL. f. in ENGL., Bot. Jahrb. XVI (1893) p. 579; BOERL., Handl. Fl. Ned. Ind. II (1899) p. 499, 509; BAKER and RENDLE in THIS-DYER, Fl. Trop. Afr. IV, 2 (1905) p. 88; PRAIN in Journ. As. Soc. Bengal LXXIV (1906) p. 301; RIDLEY, Fl. Malay Penins. II (1923) p. 456; MERRILL, Enum. Philipp. Fl. Pl. III (1923) p. 359; BACKER, Onkruidfl. Jav. Suikerrietgr. (1931) p. 514 — *Ipomoea*, subgenus *Aniseia* CLARKE in HOOK., Fl. Brit. Ind. IV (1883) p. 200; PRAIN in Journ. As. Soc. Bengal LXIII (1894) p. 104 — *Ipomoea* § *Aniseia* GAGNEP. et COURCH. in LEC., Fl. Indo-Chine IV (1915) p. 231.

Prostrate or twining herbs. Leaves linear, lanceolate, ovate or elliptic, often mucronate. Flowers on axillary peduncles, solitary or in few-flowered dichasial inflorescences. Sepals 5, herbaceous, acute or acuminate, unequal, the 3 exterior ones much larger, often decurrent on the pedicel, enlarged in fruit. Corolla broad-tubular to funnel-shaped, 5-toothed or almost entire, with 5 well-limited midpetaline hairy bands outside. Stamens and style included. Pollen smooth. Ovary glabrous, 2-celled, each cell with 2 ovules. Style 1, slender, stigmas thick, globular or oblong. Disk small or absent. Capsule globose, glabrous, 2-celled, 4-valved, 4- or less-seeded. Seeds trigonous or globose, black.

**Distribution:** Species all confined to tropical and subtropical America with the exception of one, which occurs in the tropics of the New and the Old World.

One species in Malaysia:

*Aniseia martinicensis* (JACQ.) CHOISY in Mém. Soc. Phys. Genève VIII (1838) p. 66; id. in DC., Prodr. IX (1845) p. 430; HALL. f. in ENGL., Bot. Jahrb. XVIII (1894) p. 96; id. in Bull. Herb. Boiss. V (1897) p. 382; KOORDERS in Meded. 's Lands Plantent. XIX (1898) p. 542 [*A. martiniensis* (CHOISY) HALL. f.]; BOERL., Handl. Fl. Ned.

Ind. II (1899) p. 499, 509; HALL. f. in Bull. Herb. Boiss. sér. 2, I (1901) p. 674; PRAIN in Journ. As. Soc. Bengal LXXIV (1906) p. 301; MERRILL and ROLFE in Philipp. Journ. Sc. III (1908) p. 123; KOORDERS, Exk. fl. Java III (1912) p. 111; KOORD.-SCHUM., Syst. Verz. III (1914) p. 109; BOLD., Zakfl. Java (1916) n. 796; HALL. f. in Meded. Rijks-herb. Leiden 35 (1918) p. 5; MERRILL in Journ. Roy. As. Soc. Str. Br. Spec. Numb. (1921) p. 508; RIDLEY, Fl. Mal. Penins. II (1923) p. 456; MERRILL, Enum. Philipp. Fl. Pl. III (1923) p. 359; BACKER, Onkruidfl. Jav. Suikerrietgr. (1931) p. 514 — *Convolvulus martinicensis* JACQ., Select. Stirp. Amer. (1763) p. 26, t. XVII — *C. uniflorus* BURM., Fl. Ind. (1768) p. 47, t. 21, fig. 2; DESR. in LAM., Encycl. III (1789) p. 544 — ? *C. emarginatus* VAHL, Symb. III (1794) p. 23 (I did not see the specimen of KÖNIG mentioned by VAHL); WILLD., Sp. Pl. I (1797) p. 847; Pers. Syn. Plant. I (1805) p. 177 — *Ipomoea martinicensis* (JACQ.) MEY., Prim. Fl. Esseq. (1818) p. 98 — *I. uniflora* (BURM.) R. et S., Syst. Veg. IV (1819) p. 247; BLUME, Bijdr. (1825) p. 721 (*I. uniflora* BURM.); BENTH., Fl. Austr. IV (1869) p. 425, excl. syn. *A. ensifolia*, *cernua*; F. VILL., Novis App. (1880) p. 140 (not seen); CLARKE in HOOK., Fl. Brit. Ind. IV (1883) p. 201; TRIMEN, Handb. Fl. Ceylon III (1895) p. 215; MANSON BAILEY, Queensl. Fl. IV (1901) p. 1065, excl. syn. *A. ensifolia*, *cernua*; id., Compr. Cat. Queensl. Pl. (1909) p. 349; GAGNEP. et COURCH. in LEC., Fl. Indo-Chine IV (1915) p. 244 and p. 236, fig. 29 (5) — *Convolvulus Rheedii* WALL. in ROXB., Fl. Ind. (1824) p. 70; WIGHT, Ill. Ind. Bot. (1831) p. 19, t. 8; WIGHT in HOOK., Bot. Misc. II (1831) p. 106, t. 8 — *Convolvulus pterocarpus* BERT. ex COLLA, Hort. Ripul. (1824) p. 37 (not seen) — *Aniseia uniflora* (BURM.) CHOISY in Mém. Soc. Phys. Genève VI (1833) p. 483, t. 2, fig. 9; id. in DC., Prodr. IX (1845) p. 431; WIGHT, Icon. III (1843—47) t. 850; MIQ., Fl. Ned. Ind. II (1857) p. 623; PETER in ENGL.-PRANTL, Nat. Pfl. fam. IV, 3a (1891) p. 25, fig. 12A; COOKE, Fl. Bombay II (1905) p. 231; BAKER and RENDLE in THIS.-DYER, Fl. Trop. Afr. IV, 2 (1905) p. 88; DUTHIE, Fl. Upper Ganget. Pl. II (1911) p. 122; GAMBLE, Fl. Pres. Madras V (1923) p. 924 — *Ipomoea pterocarpa* (BERT.) DON, Gen. Syst. IV (1838) p. 282 — ? *I. lanceolata* DON, l.c.; CHOISY in DC., Prodr. IX (1845) p. 390 — *Aniseia emarginata* (VAHL) HASSK., Cat. Hort. Bogor. (1844) p. 139; id., Pl. Jav. Rar. (1848) p. 518; MIQ., Fl. Ned. Ind. II (1857) p. 624 — *Calystegia mucronata* SPR. ex CHOISY in DC., Prodr. IX (1845) p. 430, pro synonym.

Herbaceous. Stems prostrate or twining, rooting in the basal parts (always?), to 1.50 m long, terete, finely striate or smooth, appressed pilose

or glabrous. Leaves narrow- to broad-oblong, obtuse, truncate, emarginate or rarely acute at the apex, mucronulate, attenuate towards the base, 3.5—7 cm long, 0.8—3 cm broad, glabrous or sparsely pilose above, sparsely pilose beneath, sometimes glabrous on both sides; petiole much shorter than the blade, 0.5—2 cm. Inflorescences axillary, 1-, sometimes 2- or 3-flowered; peduncle shorter than the leaf, 2—5 cm, more or less densely pilose, upwards often denser; pedicel shorter than the outer sepals, 5—7 mm or longer, appressed pilose with short, soft hairs; bracts small, narrow-lanceolate to subulate, sharply acute. Sepals herbaceous, reticulately nerved, the 3 outer ones much larger than the 2 inner, sparsely pilose outside, 12—20 mm long, the two outermost ones ovate, acute, mucronulate at the apex, rounded, slightly cordate or acute at the base and short-decurrent on the pedicel; third sepal lanceolate, more or less falcate, short-decurrent on the pedicel; 2 interior sepals ovate to lanceolate, acute or acuminate, 10—13 mm long, not decurrent; outer sepals enlarged in fruit, and then scarious, reticulately nerved, 2—2.5 cm long. Corolla white, funnel-shaped, 2—3 cm long; limb slightly 5-lobed; midpetaline areas hairy, with a hairy muero, the connecting fields glabrous. Stamens included, filaments decurrent on the corolla, hairy at the base. Disk obsolete. Ovary glabrous, style filiform, stigmas 2, small, thick, globular to oblong. Capsule ovoid, 2-celled, 4-valved, 4- or less-seeded; valves acute, oblong, brown outside, silvery white and lustrous inside. Seeds dull black, woolly at the angles, minutely pilose on the sides, 5—6 mm in diam.

MALAY PENINSULA, *Perak*, Kuala Dipong, SCORTECHINI 1780 (S); Kota Bahru, KING's coll. 1075 (according to PRIN); Dindings, Batu Hampar, BUCKILL, Singapore Field n. 507, March 1914 (S); *Kelantan*, Kamposa, RIDLEY s.n., Aug. 1889 (S); *Selangor*, VESTERDAL 41, Nov.-Dec. 1935 (S); *Pahang*, Pekan, RIDLEY s.n. (S); *Pekan*, Katapang, RIDLEY 1248, May 1890 (S); *Malacca*, GRIFFITH, MAINGAY (according to CLARKE and PRIN); JAGOR 268 (BD).

SUMATRA, without precise locality, KORTHALS s.n. (L); KORTHALS 87 (B, L); KORTHALS 252 (L); East Coast, near Serdang, rather rare, LÖRZING 3255, Oct. 1914 (B); between Serdang and Rantau pandjang, not rare, LÖRZING 3374, Nov. 1914 (B); *Djambi*, Pahoe, edge of forest, POSTHUMUS 1047, Oct. 1925 (B, L); Palembang, Kajoeagoeng, DE VOOGD 74, Febr. 1928 (B).

JAVA, according to BACKER in the lower parts of the island, in marshy grass-fields, along water, along sawahs, rather frequent in some localities, but in general rare. *Bantam*, Tjaringin, edge of pool, BACKER 7348, March 1913 (B); *Batavia*, "in fruticetis uliginosis circa Bataviam", BLUME s.n. (B, L); id., BLUME 1113 (L); Meester Cornelis, in wet grassy places, BACKER 33864, May 1903 (B, L); Kali Soenter, in wet grassy places, BACKER 33840 (B); Kampong Goesti, wet grassy places, BACKER 33841, June 1904 (B); Buitenzorg, Tjibinong, on dike of pool, VAN STEENIS 3088, Sept. 1929 (B); cult. in Botanic Garden, II. Q. E. 9 (B); Cheribon,

between Haoergeulis and Tjipoenegara, BACKER 16831, Oct. 1914 (B); Malang, Djatirata, railroad in marshy forest, many specimens, BACKER 7831, May 1913 (B); S.-Djatirata, along ditch, many specimens, BACKER 8134, May 1913 (B).

BORNEO, without precise locality, KORTHALS 85 (L); W. division, Kapocas, near Soekalanting and Semitau, HALLIER 84, Borneo-expedition 1893—94 (B); S. and E. division, Bandjermasin, KORTHALS 252 (L); West-Koetai, near Moeara Kaman, dried up padang, common, ENDERT 1483, June 1925 (B); West-Koetai, near Lakoem, secondary forest, along brook, ENDERT 1749, June 1925 (B).

CELEBES, Celebes and Dependencies, Pangkadjene, on rocks, TEYSMANN 12106 (B); Wavotobi Do., marshy forest, KJELLBERG 867, March 1929 (B); Manado, near Manado, sandy beach in thin, low forest, rather rare, KOORDERS 16558 $\beta$ , Dec. 1894 (B, BD, L).

NEW GUINEA, Dutch New Guinea, New Guinea expedition 1904—1905, near Etnabay, KOCH s.n. (L); Merauke, in alangfield, VERSTEEG 1949, Nov. 1907 (B); Mamberamo, FEUILLETAU DE BRUYN 136, Oct. 1914 (B); mouth of Mamberamo, JANOWSKY 424, Sept. 1913 (B); Pionierbivak, c. 50 m, clearings, among ferns, DOCTERS VAN LEEUWEN 9352, June 1926 (B); Papua, Lake Daviumbu, Middle Fly River, swamp margins, BRASS 7651, Sept. 1936 (L).

PHILIPPINE ISLANDS, without precise locality, VIDAL 3356 (according to MERRILL, 1923); according to MERRILL among grasses in freshwater swamps at low altitudes; very rare or local in the Philippines; Palawan, Lake Manguao, MERRILL 9458, Apr. 1913 (B, K, L, P).

Distribution: Tropics of the Old and the New World.

Vernacular names: akar ulan putih (Malay Peninsula, RIDLEY), akar lidah patong (Malay Peninsula, JAGOR, RIDLEY), bagioe seroet (Djambi, POSTHUMUS), karoet (Palembang, DE VOOGD), hat bijawak (Borneo, W.-Koetai, ENDERT); m(w)anaring-i-lawanan, wanaring pante (Manado, KOORDERS).

Use: as a vegetable (Malay Peninsula, RIDLEY; Borneo, BOERLAGE).

## X. CONVOLVULUS L.

L., Spec. Pl. ed. 1 (1753) p. 153; BLUME, Bijdr. (1825) p. 724; CHOISY in Mém. Soc. Phys. Genève VI (1833) p. 477; id. in DC., Prodr. IX (1845) p. 399; MIQ., Fl. Ned. Ind. II (1857) p. 621; BENTH., Fl. Austr. IV (1869) p. 428; BENTH. et Hook., Gen. Plant. II (1876) p. 874; CLARKE in Hook., Fl. Brit. Ind. IV (1883) p. 217; BAILL., Hist. Pl. X (1891) p. 321; PETER in ENGL.-PRANTL, Nat. Pfl. fam. IV, 3a (1891) p. 33; HALL f. in ENGL., Bot. Jahrb. XVI (1893) p. 579; TRIMEN, Handb. Fl. Ceyl. III (1895) p. 226; BOERL., Handl. Fl. Ned. Ind. II (1899) p. 501, 509; BAKER and RENDLE in THIS.-DYER, Fl. Trop. Afr. IV, 2 (1905) p. 88; KOORDERS, Exk. fl. Java III (1912) p. 111; GAGNEP. et COURCH. in LEC., Fl. Indo-Chine IV (1915) p. 300 —



*Stevogia* NECK., Elem. II (1790) p. 23 — *Rhodorrhiza* WEBB in Bot. Reg. (1841) Misc. p. 69 — *Pantocsekia* GRISEB. in Oesterr. Bot. Zeitschr. XXIII (1873) p. 267.

Annual or perennial herbs, undershrubs or shrubs with prostrate, erect or climbing stems. Hairs simple or rarely with 2 arms. Leaves entire, or rarely more or less deeply lobed, mostly spathulate, attenuate to the petiole or hastate. Flowers regular, axillary, solitary, in few-flowered cymes or in dense involucre heads. Sepals 5, equal or subequal, obtuse or acute. Corolla various in length, funnel-shaped, white, pink, blue or yellow, with 5 often not well-defined midpetaline areas. Stamens and style included; filaments often unequal, filiform, pollen smooth, ellipsoid; disk annular or cup-shaped; ovary 2-celled, each cell with 2 ovules; style simple, filiform, stigmas 2, linear or filiform. Capsule 2-celled, usually 4-valved, 4- or less-seeded; seeds black or brown, mostly glabrous.

**Distribution:** In the temperate and subtropical regions of both hemispheres, rarer in the tropics.

One species in Malaysia:

***Convolvulus arvensis* L.**, Spec. Pl. ed. 1 (1753) p. 153; CHOISY in Mém. Soc. Phys. Genève VI (1833) p. 479; id. in DC., Prodr. IX (1845) p. 406; CLARKE in HOOK., Fl. Brit. Ind. IV (1883) p. 219; WATT, Dict. Econ. Prod. Ind. II (1889) p. 518; HALL, f. in ENGL., Bot. Jahrb. XVIII (1894) p. 108; BAKER and WRIGHT in THIS-DYER, Fl. Cap. IV, 2 (1904) p. 75; COOKE, Fl. Bombay II (1905) p. 234; BAKER and RENDLE in THIS-DYER, Fl. Trop. Afr. IV, 2 (1905) p. 97; DUTHIE, Fl. Upper Ganget. Pl. II (1911) p. 106; GAMBLE, Fl. Pres. Madras V (1923) p. 925 — *C. Malcolmi* ROXB., Fl. Ind. I (1832) p. 474.

Perennial. Stems prostrate or twining, angular, sparsely pubescent or glabrous. Leaves petiolate, the petiole shorter than the blade; blade entire, ovate-oblong, oblong or lanceolate, mostly obtuse and mucronulate at the apex, hastate or sagittate at the base, to 4–5 cm long, often more or less secund. Flowers in axillary, 1- or sometimes 2–3-more-flowered cymes; peduncles angular, shorter or longer than the leaves; bracts linear, about 3 mm long; pedicels much longer than the calyx. Sepals slightly unequal, the 2 exterior ones a little shorter, oblong-elliptic, obtuse, shortly ciliate, the interior ones broader, almost orbicular, obtuse or slightly retuse, more or less distinctly mucronulate, 3.5–5 mm long. Corolla white or pink or white with pink or red midpetaline areas outside or pink with red or white midpetaline areas outside, broadly funnel-shaped, about 2 cm long, the limb shallowly

lobed. Stamens slightly unequal, the filaments with broadened base, papillose at the margin. Ovary glabrous, style filiform, stigmas filiform. Capsule ovoid-globose, glabrous, 5—8 mm long, 2-celled, 4-valved, 4-seeded. Seeds dark brown or black, 3—4 mm long.

JAVA, Malang, Semeroe-complex, saddle G. Tengger-Ajah ajah djambanga, 2100 m, on uncultivated fields, frequent, GISIUS 70, Sept. 1927 (Pa); according to an annotation on the label, by BACKER, in 1930 in the garden of the Semeroe farm.

**Distribution:** Widely spread in the temperate and subtropical parts of both hemispheres, rarely in the tropics.

**Vernacular names:** small bindweed, akkerwinde (Dutch).

*Convolvulus sphaerostigma* CAV., Icon. V (1799) p. 54, t. 481 (= *Jacquemontia hirsuta* CHOISY) has been recorded from Mindanao and from Mexico. According to MERRILL, Enum. Philipp. Fl. Pl. III (1923) p. 359 the Mindanao record was based either on an erroneously localized specimen (Malaspina Expedition) or on an erroneously identified one.

#### XI. CALYSTEGIA R. BR.

R. BR., Prodr. Fl. Nov. Holl. ed. 1 (1810) p. 483, nom. generic. conserv.; CHOISY in Mém. Soc. Phys. Genève VIII (1837) p. 485; id. in DC., Prodr. IX (1845) p. 433; MIQ., Fl. Ned. Ind. II (1857) p. 624; BENTH. et HOOK., Gen. Plant. II (1876) p. 874; CLARKE in HOOK., Fl. Brit. Ind. IV (1883) p. 217; BAILL., Hist. Pl. X (1891) p. 324; PETER in ENGL.-PRANTL, Nat. Pfl. fam. IV, 3a (1891) p. 36; HALL. f. in ENGL., Bot. Jahrb. XVI (1893) p. 580; BOERL., Handl., Fl. Ned. Ind. II (1899) p. 500, 509; PRAEN in Journ. As. Soc. Bengal LXXIV (1906) p. 299; KOORDERS, Exk. fl. Java III (1912) p. 111; RIDLEY, Fl. Malay Penins. II (1923) p. 454 — *Volulus* MEDIC. in Staatsw. Vorles. Churpf. Phys. Oek. Ges. I (1791) p. 202 (not seen) — *Convolvulus* sect. *Calystegia* (R. BR.) BENTH., Fl. Austr. IV (1869) p. 428, 430.

Prostrate or twining, perennial herbs. Leaves petiolate, mostly glabrous, entire or lobed, the base sagittate to hastate. Flowers axillary, solitary or in few-flowered cymes. Bracts 2, mostly large, foliaceous, broad-ovate, often inflated, embracing the calyx. Sepals 5, subequal, ovate to oblong, acute or obtuse, herbaceous. Corolla medium-sized or large, glabrous, campanulate to funnel-shaped, slightly lobed or subentire, white or pink or rarely yellowish, outside with 5 distinct mid-petaline bands. Stamens and style included; filaments subequal, pollen globular, smooth; style filiform, stigmas 2, mostly oblong or elliptic,

complanate, ovary 1-celled or imperfectly 2-celled, 4-ovuled. Capsule globose, 4-valved, 4-seeded; seeds black, smooth or verrucose.

Distribution: Warm and temperate regions.

Only species in Malaysia:

***Calystegia hederacea*** WALL. in ROXB., Fl. Ind. II (1824) p. 94 (not seen); id., Cat. (1828) n. 1328; CHOISY in Mém. Soc. Phys. Genève VIII (1837) p. 485; id. in DC., Prodr. IX (1845) p. 434; MIQ., Fl. Ned. Ind. II (1857) p. 625; CLARKE in HOOK., Fl. Brit. Ind. IV (1883) p. 217; HALL. f. in ENGL., Bot. Jahrb. XVIII (1894) p. 111; BOERL., Handl. Fl. Ned. Ind. II (1899) p. 509; BAKER and RENDLE in THIS-DYER, Fl. Trop. Afr. IV, 2 (1905) p. 99; PRAIN in Journ. As. Soc. Bengal LXXIV (1906) p. 299; DUTHIE, Fl. Upper Ganget. Pl. II (1911) p. 105; RIDLEY, Fl. Malay Penins. II (1923) p. 454 — *Convolvulus Wallichianus* SPR., Syst. IV, 2 (1827) p. 61 — *C. acetosaefolius* TURCZ. in Bull. Mosc. (1840) p. 73 (not seen) — *Calystegia acetosaefolia* TURCZ., Fl. Baic.-Dahur. II, 2 (1856) p. 289, in nota (not seen) — *Volulus hederaceus* (WALL.) O. K., Rev. Gen. II (1891) p. 447 — *Calystegia abyssinica* ENGL. in Abh. Preuss. Akad. Wiss. 1891, II (1892) p. 347 (not seen).

A probably perennial herb, stems slender, prostrate or twining, glabrous. Leaves glabrous, 1.5–4(–7.5, PRAIN) cm long, 0.5–2(–2.5, PRAIN) cm broad, oblong to triangular, obtuse or slightly emarginate at the apex, sagittate to cordate at the base, the basal auricles more or less spreading, entire or 2-lobed; the petiole shorter than or nearly as long as the blade. Flowers axillary, solitary, the peduncle 2–5 cm long; bracts 2, enclosing the sepals, elliptic, obtuse, 6–8 mm long, persistent. Sepals 5, oblong, obtuse, mucronulate, glabrous, the outer ones about 6(–7.5, PRAIN) mm long, the inner ones somewhat shorter. Corolla campanulate, pinkish-purple (PRAIN), about 2 cm long, the limb subentire; stamens and style included, filaments slightly unequal, dilated at the base, inserted close to the corolla base; disk low, cup-shaped; ovary glabrous, conical; style filiform, stigmas elongate. Capsule (PRAIN) ovoid, subacute, glabrous, 7.5 mm long; seeds glabrous.

MALAY PENINSULA, Penang, WALLICH 1328/2, collected by PORTER (S). According to PRAIN possibly only a casual weed.

Distribution: Africa (Abyssinia), Asia (from Punjab and Afghanistan to N. and E. Bengal, Penang, and to China, Japan and Amurland).

***Calystegia sepium*** (L.) R. BR., Prodr. Fl. Nov. Holl. ed. 1 (1810) p. 483; MIQ., Fl. Ned. Ind. II (1857) p. 624; BOERL., Handl. Fl. Ned.

Ind. II (1899) p. 509; KOORDERS, Exk. fl. Java III (1912) p. 111 — *Convolvulus sepium* L., Spec. Plant. ed. 1 (1753) p. 153 — *Volulus sepium* (L.) JUNGHER in Oesterr. Bot. Zeitschr. XLI (1891) p. 133.

Although this species has been recorded from Java by MIQUEL and after him by BOERLAGE and by KOORDERS, it is neither represented in the large collections from that island in the herbaria at Buitenzorg and at Leiden nor in one of the other collections I could examine. I, therefore, believe that MIQUEL's citation of Java is incorrect and that it has never been collected in that island.

**Calystegia affinis** ENDL. The specimen HOLLRUNG 155, collected in New Guinea, Finschhafen, and mentioned by SCHUMANN in ENGL., Bot. Jahrb. IX (1887) p. 216 under *Calystegia affinis* ENDL., Prodr. Fl. Norfolk. (1833) p. 51, n. 103, belongs to *Ipomoea gracilis* R. BR. (= *I. denticulata* (DESR.) CHOISY). See SCHUM. and LAUTERB., Fl. Deutsch. Schutzgeb. (1901) p. 516.

## XII. SHUTERIA CHOISY

CHOISY in Mém. Soc. Phys. Genève VI (1833) p. 485, t. 2, fig. 11, non *Shuteria* WIGHT et ARNOTT, 1834; id., in DC., Prodr. IX (1845) p. 435; HOUSE in Bull. Torr. Bot. Club XXXIII (1906) p. 318 — *Hewittia* WIGHT et ARNOTT in Madr. Journ. Sc. Ser. I, V (1837) p. 22 (not seen); MIQ., Fl. Ned. Ind. II (1857) p. 620; BENTH. et HOOK., Gen. Plant. II (1876) p. 873; CLARKE in HOOK., Fl. Brit. Ind. IV (1883) p. 216; BAILLON, Hist. Pl. X (1891) p. 324; PETER in ENGL.-PRANTL, Nat. Pfl. fam. IV, 3a (1891) p. 32; CHODAT et ROULET in Bull. Herb. Boiss. I (1893) p. 191; HALL. f. in ENGL., Bot. Jahrb. XVI (1893) p. 581; TRIMEN, Handb. Fl. Ceyl. III (1895) p. 225; BOERL., Handl. Fl. Ned. Ind. II (1899) p. 499, 509; BAKER and RENDLE in THIS.-DYER, Fl. Trop. Afr. IV, 2 (1905) p. 100; PRAIN in Journ. As. Soc. Bengal LXXIV (1906) p. 300; KOORDERS, Exk. fl. Java III (1912) p. 111; GAGNEP. et COURCH. in LEC., Fl. Indo-Chine IV (1915) p. 298; RIDLEY, Fl. Malay Penins. II (1923) p. 455; MERRILL, Enum. Philipp. Fl. Pl. III (1923) p. 359; BACKER, Onkruidfl. Jav. Suikerrietgr. (1931) p. 515 — *Palmia* ENDL., Gen. Pl. (1839) p. 653.

Herbaceous, pubescent plants, twining or prostrate. Leaves entire, angular or lobed, cordate. Flowers axillary, solitary or in few-flowered cymes. Bracts 2, oblong- or linear-lanceolate, acuminate, at some distance from the calyx. Sepals 5, acute, herbaceous, three outer ones larger, ovate, accrescent in fruit, two inner ones much smaller. Corolla

medium-sized, campanulate to funnel-shaped, 5-angled, pale yellow or white, mostly with a purple eye. Stamens 5, included, filaments linear with dilated base; pollen smooth. Disk ring-shaped. Ovary hairy, 1-celled or imperfectly 2-celled at the top; ovules 4; style filiform, included; stigmas 2, ovate-oblong, complanate. Capsule 1-celled, more or less distinctly 4-valved, 4- or less-seeded. Seeds black, glabrous, opaque.

**Distribution:** Tropical Africa, tropical Asia, Malaysia and Polynesia.

**Remarks.** In recent literature we generally find the name *Hewittia* WIGHT et ARNOTT (1837) for this genus. *Shuterea* CHOISY (1833) is, however, an earlier name and is adopted here. In consequence the name *Shuteria* WIGHT et ARNOTT (1834), a genus of *Leguminosae*, has to be altered.

One species in Malaysia:

***Shuterea sublobata*** (L. f.) HOUSE in Bull. Torr. Bot. Club XXXIII (1906) p. 318 — *Convolvulus sublobatus* L. f., Suppl. (1781) p. 135 — *C. bracteatus* VAHL, Symb. III (1794) p. 25 — *C. bicolor* VAHL, Symb. III (1794) p. 25; CURT., Bot. Mag. (1821) t. 2205; ROXB., Fl. Ind. ed. CAREY et WALL. II (1824) p. 57; id., Fl. Ind. I (1832) p. 475 (mentioned by ROXBURGH as *C. bicolor* WILLD.) — *Ipomoea Weinmanni* R. et S., Syst. IV (1819) p. 243 — *I. malabarica* auct. non R. et S.; BL., Bijdr. (1825) p. 715 — *I. bracteata* (VAHL) R. et S., Syst. IV (1819) p. 227; BL., Bijdr. (1825) p. 711 (mentioned by BLUME as *I. bracteata* VAHL) — *Shuterea bicolor* (VAHL) CHOISY in Mém. Soc. Phys. Genève VI (1833) p. 48, t. 2, fig. 11; id. in DC., Prodr. IX (1845) p. 435; VAN HOUTTE, Fl. des Serres IV (1848) t. 421; CHOISY in ZOLL., Syst. Verz. 2. Heft (1854) p. 130, 133 (*Shuteria bicolor*) — *Convolvulus hederaceus* BLANCO, Fl. Filip. ed. 1 (1837) p. 90; id., ed. 2 (1845) p. 66 (not seen); id., ed. 3, I (1877) p. 124, non L. (according to MERRILL, Spec. Blanc. (1918) p. 326) — *Hewittia bicolor* (VAHL) WIGHT et ARN. in Madr. Journ. Sc. Ser. I, V (1837) p. 22 (not seen); WIGHT, Icon. III (1843) p. 45, t. 835 (*Heivetia bicolor*); id., Illustr. II (1850) t. 168 b, fig. VI (*Hewetia*); MIQ., Fl. Ned. Ind. II (1857) p. 620; CLARKE in HOOK., Fl. Brit. Ind. IV (1883) p. 216; HEMSLE., Rep. Chall., Bot. I, 3 (1884) p. 170; FORBES, Wander., Germ. ed. II (1886) p. 222; VIDAL y SOLER, Rev. Plant. Vasc. Philipp. (1886) p. 197; TRIMEN, Handb. Fl. Ceyl. III (1895) p. 226; HALL. f. in Versl. 's Lands Plantent. 1895 (1896) p. 126; id. in Bull. Herb. Boiss. V (1897) p. 379, 380; KOORDERS in Meded. 's Lands Plantent. XIX (1898) p. 542; BOERL., Handl. Fl.

Ned. Ind. II (1899) p. 509; HALL. f. in Bull. Herb. Boiss., sér. 2, I (1901) p. 675; BAKER and WRIGHT in THIS.-DYER, Fl. Cap. IV, 2 (1904) p. 68; COOKE, Fl. Bombay II (1905) p. 231; BAKER and RENDLE in THIS.-DYER, Fl. Trop. Afr. IV, 2 (1905) p. 100; PRAIN in Journ. As. Soc. Bengal LXXIV (1906) p. 300; MERRILL in Philipp. Journ. Sci. I (1906) Suppl. p. 120; KOORDERS, Exk. fl. Java III (1912) p. 111; KOORDERS-SCHUM., Syst. Verz. (1910—13), Conv. p. 2; id. (1914) p. 109; GAGNEP. et COURCH. in LEC., Fl. Indo-Chine IV (1915) p. 298, 299, fig. 34; GAMBLE, Fl. Pres. Madras V (1923) p. 924; RIDLEY, Fl. Malay Penins. II (1923) p. 455, fig. 117 — *Aniseia Afzelii* DON, Gen. Syst. IV (1838) p. 295 — *Ipomoea* ? *teretistigma* CHOISY in DC., Prodr. IX (1845) p. 373 — *I. panduraeformis* DRÈGE mss. ex CHOISY in DC., Prodr. l.c. p. 435, pro synonym. — *Shutereaia bicolor* (VAHL) CHOISY var. *abbreviata* CHOISY in DC., Prodr. l.c. p. 435 — *Aniseia bracteata* (VAHL) HASSK., Pl. Jav. Rar. (1848) p. 516 — *Hewittia asarifolia* KLOTZSCH in PETER, Reise Mossamb. Bot. (1862) p. 242 — *H. hirta* KLOTZSCH l.c. p. 243 — *H. sublobata* (L. f.) KUNTZE, Rev. Gen. (1891) p. 441; HALL. f. in ENGL., Bot. Jahrb. XVIII (1894) p. 111; BOLD., Zakfl. Java (1916) n. 802; MERRILL, Spec. Blanc. in Bur. of Sc. Publ. 12 (1918) p. 326; id., Enum. Philipp. Fl. Pl. III (1923) p. 359; BACKER, Onkruidfl. Jav. Suikerrietgr. (1931) p. 515 — *H. Barbeyana* CHOD. et ROULET in Bull. Herb. Boiss. I (1893) p. 192 — *Ipomoea benguelensis* BAKER in Kew Bull. (1894) p. 69 — *I. phyllosepala* BAKER l.c. — *Bonamia Volkensii* DAMMER in Engl., Pfl. Ost. Afr. C (1895) p. 329.

A herbaceous plant with slender, prostrate or twining stems, 1—2 m long (BACKER), more or less densely pubescent, glabrescent, angular, occasionally rooting. Leaves petiolate, petiole pubescent, 1—6 cm long; blade ovate to broad-ovate in outline, appressed pilose with short hairs on both sides, especially beneath, or nearly glabrous, 3—12 cm long, 4—10 cm broad, cordate or sometimes truncate at the base, the auricles entire or angular, sometimes spreading and then the blade more or less hastate; the apex acuminate, acute or obtuse, mucronulate. Peduncles shorter or longer than the petioles, 1—10 cm long, pubescent, upwards often more densely, 1- or sometimes 2—3-flowered; bracts 0.5—1.5 cm long, oblong-lanceolate or narrower, much exceeding the very short, up to 3, in fruit up to 5 mm long pedicels. Sepals more or less hairy on their surface and along their margins, unequal, the two outer ones much larger than the inner, broad to narrow-ovate, acute or obtusish, 9—15 mm, later to 17 mm long, the third more or less oblique, the fourth and fifth smaller, ovate with broadened and scariously margined

base, 7—7.5 mm long; nerves of sepals prominent in fruiting stage. Corolla campanulate to funnel-shaped, 2—2.5 cm long, creamy white to yellow or greenish yellow, often with a purple or reddish brown centre and with 5 pale yellow, pilose midpetaline bands, the limb with 5 very short, rounded, emarginate, mucronulate lobes. Stamens included. Filaments inserted about 4 mm above the corolla base, their base broadened and minutely papillose. Ovary densely hairy with long white hairs, also some hairs at the style base. Disk low, shallowly lobed, pale yellow (BACKER). Capsule depressed-globose to more or less quadrangular, crowned by the style, patently pilose, about 8 mm high and about 10 mm broad, irregularly dehiscent by valves. Seeds 4—2, black, opaque, glabrous, except the pubescent hilum, 5—6 mm long.

MALAY PENINSULA, Perak, Larut, SCORTECHINI (according to PRAIN); Malacca, Malacca Hill, near the chapel, RIDLEY s.n. (S).

SUMATRA, Atjeh and Dependencies, valley of Alocer Lampahan, wayside, VAN STEENIS 6072, Aug. 1934 (B); East Coast, Gedong djohore, S. of Medan, 50 m, not rare in low thickets and grassy places, LÖRZING 3531, Febr. 1915 (B); Sibolangit, 500 m, rather rare, in thickets, LÖRZING 4484, Nov. 1916 (B, L); E. of Locboepakam, 20 m, rather rare, in thickets and grassy places, LÖRZING 3296, Oct. 1914 (B); near Limang, W. of Kabandjahe, in the forest Sampaharoe, 530 m, GALOENGI 227, April 1919 (B); West Coast, Padang, without collector's name, n. 230 (B); Padang, KORTHALS 234 (L); G. Malintang, foot, 800 m, wayside, in thickets, BÜNNEMEYER 4450, Aug. 1918 (B); Lampoenngs, near Telok, ZOLLINGER 3038 (BD).

JAVA, from West to East Java, in the lower parts of the island, in grassy fields, thickets and hedges, along dikes and waysides locally rather frequently (BACKER). Without precise locality, BLUME 59, 1002 (L); HOFFMANNSEGG s.n., named *Batatas bibracteata* KLOTZSCH (BD); HORSFIELD, Conv. 7 (K); id., s.n. (L, U); JAGOR 589 (BD); JUNGHUIN s.n. (L); Bantam, Pandeglang, 300 m, wayside, BACKER 7386, March 1913 (B); id., 200 m, on hedge, BACKER 7430, March 1913 (B); between Malingping and Penjawaengan, 5 m, grassy wayside, BACKER 1533, June 1911 (B); S.E. of Pasaoeran, 200 m, waysides, thickets, BACKER 7250, March 1913 (B); Batavia, Batavia, KUHIL and VAN HASSELT s.n. (L); id., Pengoedjian, 5 m, grassy wayside, BACKER 32301, June 1903 (B); Laanhof, S.W. of Weltevreden, 20 m, grassy fields, BACKER 32300, July 1902 (B); Meester Cornelis, 20 m, grassy field, BACKER 32302, Aug. 1904 (B); Bidara tjina, S. of Meester Cornelis, 20—25 m, EDELENG s.n. (B); N. of Wanajasa, 500 m, grassy wayside, BACKER 14355, June 1914 (B); Tjikoempai, E. of Poerwakarta, 110 m, HARMSSEN 118, Dec. 1921 (B); Buitenzorg, Buitenzorg, 250 m, along railroad, BACKER 26039, Sept. 1918 (B); Buitenzorg, 230 m, on hedge, HALLIER 205a, Apr. 1893 (B); id., thickets and grassy places behind Kampong tjina, along road to Batoetoelis, HALLIER 205b, Nov. 1894 (B); Buitenzorg, 235 m, on hedges, between Witte paal and Tanah Sereal, HALLIER s.n., May 1895 (B, L); Depok, 93 m, BURCK and DE MONCIY s.n. (B); Koeripan, limestone, BLUME s.n. (L); Dramaga, W. of Buitenzorg, wayside, bamboo thicket, 250 m, BAKHUIZEN VAN DEN BRINK Jr. 2112, Jan. 1923 (B, L); Pasir Gaok near Tjimoelang, N.W. of

Buitenzorg, 250 m, thickets, wayside, BAKHUIZEN VAN DEN BRINK 5446, Apr. 1922 (B, BD, K, L); Tjiseëng, 100 m, limestone hills, in thickets, BEUMÉE A 922, May 1932 (B); Palaboeanratoe, Tjidaoen, beach, KOORDERS 34663  $\beta$ , Apr. 1899 (B); Tji Solok, Wijnkoopsbaai, 5 m, grassy field, BACKER 724, Dec. 1911 (B); Tjiletoeh, Zandbaai, 1 m, grassy wayside, BACKER 25658, Aug. 1918 (B); Kalapanoenggal, 100 m, grassy wayside, BACKER 5790, Dec. 1912 (B); Babakan, LEHMANN s.n. (BD); cultivated in the Botanic Garden, Buitenzorg, n. XV. H. 39 and 39 A (according to HALLIER); id. n. XV. K. B. XI, 2 (B); Priangan, Garoet (?), BURCK (?) s.n. (B); Rawah Lakbok near Bandjar, 40 m, BACKER 4209bis, Aug. 1912 (B); Soekaradja, S. of Tasikmalaja, 250 m, grassy wayside, BACKER 8523, Aug. 1913 (B); Cheribon, between Haoergeulis and Tjipoenegara, 25 m, dike of railroad, BACKER 16846, Oct. 1914 (B); Pekalongan, Soebah, KOORDERS 27338  $\beta$ , Apr. 1897 (B); id., 200 m, in teak-wood, BEUMÉE 4311, July 1919 (B); Batang, 5 m, grassy wayside, BACKER 15499, Sept. 1914 (B); Dockoewringin near Slawi, 45 m, administrator sugar-estate Dockoewringin 83, Febr. 1915 (B); Banjoemas, KIEVITS 1857 (Pa); KIEVITS 3469 (Pa); Tjilatjap, grassy field along Serajoe, 1 m, BACKER 4577, Sept. 1912 (B); Kedoe, Keboemen, 25 m, bamboo hedge, BRINKMAN 531, Dec. 1932 (B); Semarang, HORSFIELD s.n. (according to MIQUEL); Mangkang, between Semarang and Kaliwoengoe, wayside in teak-wood, DOCTERS VAN LEEUWEN s.n., May 1910 (B); forestry Manggar, 50 m, teak-wood on marl, BEUMÉE 5452, Dec. 1920 (B); virgin forest, Kedoeengdjati, KOORDERS 24899  $\beta$ , Sept. 1896 (B, L); Kali Woengoe, 5 m, BACKER 16475, Sept. 1914 (B); Djapara-Rembang, Ngarengan, KOORDERS 33505  $\beta$ , May 1899 (B); id., KOORDERS 33506  $\beta$ , May 1899 (B); id. KOORDERS 35610  $\beta$ , May 1899 (B); id., KOORDERS 35613  $\beta$ , May 1899 (B); forestry Bekoetok, 250 m, tertiary lime-marl, BLOKHUIS s.n., July 1918 (B); Kediri, E. slope G. Wilis, above Madja, 300 m, grassy wayside, BACKER 11633, Febr. 1914 (B); Gadoengan Pare, 300—500 m, KOORDERS 22891  $\beta$ , June 1896 (B, L); Soerabaja, Soerabaja, DORGELO 427, May 1922 (Pa); id., DORGELO 746, July 1922 (Pa); id., 5 m, grassy field, BACKER 4180, June 1912 (B); Djombang, without collector's name (Pa); Malang, Lawang, 700 m, MOUSSET 813 (B); Djatiroto, 29 m, VERMEULEN 6, June 1921 (B); id., 25 m, railroad in forest, BACKER 7834, May 1913 (B); id., 20 m, railroad, BACKER 8048, May 1913 (B); Besoeki, Soemberwringin, E. of Bondowoso, 650 m, grassy wayside, BACKER 9486, Oct. 1913 (B); Djember, 85 m, ULTÉE s.n. (B); N.E. of Djember, 150 m, grassy wayside, BACKER 17762, Dec. 1914 (B); Poeger, 10 m, shady wayside, BACKER 18242, Dec. 1914 (B); Poeger-Watangan, KOORDERS 20925  $\beta$ , Oct. 1895 (B); id., KOORDERS 21022  $\beta$ , Oct. 1895 (B); id., 5 m, on sand, KOORDERS 21082  $\beta$ , Oct. 1895 (B); G. Ikan, near Banjoewangi, on limestone rocks, ZOLLINGER 2898 Z. M., May 1845 (B, BD); Madoera, Bangkalan, 5 m, grassy wayside, BACKER 19097, Febr. 1915 (B); Ketapangdaja, 15 m, grassy wayside, BACKER 20026, March 1915 (B); between Djelgong and Mektisari, 50—100 m, grassy waysides, BACKER 20038, March 1915 (B); between Rapa and Mektisari, 100 m, on hedge, BACKER 20162, March 1915 (B); hills N. of Pagantenan, 150 m, grassy wayside, BACKER 20588, March 1915 (B); Amboenten, 5 m, grassy wayside, BACKER 21223, July 1916 (B); Kangean Archipelago, Kangean, Tambajangan, 130 m, grassy field, BACKER 27487, March 1919 (B).

BORNEO, S. and E. division, Bandjermasin, MOTLEY 606 (K).

CELEBES, Celebes and Dependencies, S.W. Celebes, Lambasang, 950 m, wayside, BÜNNEMEYER 11150, Apr. 1921 (B); Baelo near Lambasang, 950 m, way-



side, BÜNNEMEYER 11289, May 1921 (B); Tjampalagian, RACHMAT 238 (exp. VAN VUUREN), July 1913 (B); Pasar Dadjo, RACHMAT 766 (exp. VAN VUUREN), Oct. 1913 (B); Bontoparang, 50 m, wayside, BÜNNEMEYER 10663, March 1921 (B); E. Celebes, Kendari, KJELLBERG 806, March 1929 (B); Manado, near Amoenang, very rare, KOORDERS 16557  $\beta$ , March 1895 (B, BD, L); Sibalaja, 20 m, DONGGALA 32, Jan. 1929 (B).

BALI, S. Bali, Kintamani, 1400 m, DE VOOGD sub 2502 (on a sheet with *Porana racemosa* ROXB.), May 1936 (B).

LOMBOK, Rindjani, N. side, Labochan tjareh, 0—20 m, on dry soil, ELBERT 622, Apr. 1909 (L); id., Bajan, 125—225 m, on sand, ELBERT 660, Apr. 1909 (L).

SOEMBAWA, Bima, Donggo, Kenanta, 100—300 m, in dry region, ELBERT 3579, Dec. 1909 (L).

FLORES, Ende, 50 m, dry Cocos grove, Mrs. RENSCH 1003, June 1927 (B, BD); Manggarai, 700 m, thicket, DE VOOGD 2847, Sept. 1936 (B).

TIMOR, without precise locality, without collector's name (L); JONKER 326, Apr. (U); Koepang, R. BROWN s.n., Apr. 1803 (S); id., HOMERON s.n., Voyage de l'Astrolabe et de la Zélée, 1841 (P); TEYSMANN s.n. (B); N. Middle Timor, Noil Toko, 500 m, WALSH 389, May 1929 (B); S. Middle Timor, Kolbauo, sea-shore, WALSH 476, Apr. 1929 (B); Portuguese Timor, Delhi, without collector's name, n. 8 (B).

WETAR, TREUB 545 (B).

LETI, TREUB 491 (B).

MOLUCCAS, Ternate, N. Castella, 100 m, in thickets, BEGUIN 1603, May 1921 (B, L); Timorlaoet (according to HEMSLEY, 1884).

NEW GUINEA, Territory of New Guinea, LAUTERBACH 3031, July 1899 (BD).

PHILIPPINE ISLANDS. "Throughout the Philippines in open grasslands and waste places, at low and medium altitudes, often common" (MERRILL). Without precise locality, PERROTTET s.n. (L); CUMING 1891 (K); Luzon, Prov. of Ilocos Norte, Bangui, RAMOS, Bur. of Sc. 27605, Febr.-March 1917 (B); Prov. of Benguet, Sablang, FENIX, Bur. of Sc. 12769, Nov.-Dec. 1910 (S); Prof. of Union, Bauang, ELMER 5643, Febr. 1904 (BD, K); Prov. of Nueva Vizcaya, vicinity of Dupax, MAC GREGOR, Bur. of Sc. 11394, March-Apr. 1912 (L); Prov. of Nueva Ecija, between San Jose and Carranglang, trailing in grass on damp open soils, MERRILL 241, May 1902 (BD); Rizal prov., Manila, BAUTHE s.n. (P); id., MERRILL, Bur. of Sc. 5173, Febr. 1906 (B, BD, K, L); id., MERRILL, Spec. Blanc. 698, Jan. 1915 (B, BD, K, L); Prov. Laguna, Los Baños, ELMER, 8118, Apr. 1906 (B, K); id., Los Baños, Mt. Maquiling, ELMER 18469, June-July 1917 (B, K, L, U); Mindoro, MERRILL 1266, Jan. 1903 (BD); Mindanao, Camiguin Islands, MOSELEY s.n., Challenger Exped., Jan.-Febr. 1875 (K); Camaguin (Camiguin?) de Mindanao, RAMOS, Bur. of Sc. 14498, March-Apr. 1912 (S).

Distribution: Trop. Africa, south to Natal; trop. Asia (British India, Ceylon, Indo-China, N. to China), Malaysia, Polynesia.

Vernacular names: kamet (Pekalongan, KOORDERS); sembanjan (Jav., Pekalongan, administrator sugar-estate Doekoewringin); indjeng nan (?) (Kediri, KOORDERS); lawatan (Jav., BACKER); oewi

malojon (Tontemboan-language, Manado, Celebes, KOORDERS); banafyan, palupasagig (Philipp., Panay Bisaya language, MERRILL); dinukdukto (Philipp., Igorot language, MERRILL); panggipanggi (Philipp., Sulu language, MERRILL).

### XIII. MERREMIA DENNST. ex HALL. f.

DENNST., Schlüss. Hort. Malab. (1818) p. 12, 23, 34 (nomen nudum); HALL. f. in ENGL., Bot. Jahrb. XVI (1893) p. 581; PETER in ENGL.-PRANTL, Nat. Pfl. fam. IV, 3a (1895) p. 377; BOERL., Handl. Fl. Ned. Ind. II (1899) p. 501, 509; BAKER and RENDLE in THES.-DYER, Fl. Trop. Afr. IV, 2 (1905) p. 101; PRAIN in Journ. As. Soc. Bengal LXXIV (1906) p. 302; KOORDERS, Exk. fl. Java III (1912) p. 111; RIDLEY, Fl. Malay Penins. II (1923) p. 456; MERRILL, Enum. Philipp. Fl. Pl. III (1923) p. 360; BACKER, Onkruidfl. Jav. Suikerrietgr. (1931) p. 515 — *Skinneria* CHOISY in Mém. Soc. Phys. Genève VI (1833) p. 487, t. 6; id. in DC., Prodr. IX (1845) p. 435; MIQ., Fl. Ned. Ind. II (1857) p. 487 — *Spiranthera* BOJ., Hort. Maurit. (1837) p. 226, p.p. (not seen).

Plants of various habit, mostly herbaceous or woody twiners, but also prostrate or erect herbs or low erect shrubs. Leaves very variable, entire, dentate, lobed or palmately or pedately partite or compound, rarely very small and subulate (not in Malaysia). Flowers axillary, solitary or in few- to many-flowered variously ramified inflorescences. Bracts usually small. Sepals 5, usually subequal, elliptic to lanceolate, acute or acuminate or ovate to orbicular, obtuse or emarginate, concave, in several species enlarged in fruit. Corolla funnel-shaped or campanulate, mostly glabrous, white or yellow to orange, generally with 5 distinctly nerved midpetaline bands; the limb slightly 5-lobed. Stamens and style included. Anthers often contorted; filaments filiform, often unequal; pollen smooth. Ovary 2- or 4-celled, rarely incompletely 2-celled, 4-ovuled; style filiform; stigma biglobular. Fruit a capsule, generally dehiscent by 4 valves or more or less irregularly dehiscent, 4—1-celled, 4- or by abortion less-seeded. Seeds glabrous, pubescent or villose, especially at the margins.

**Distribution:** Widely spread in the tropics of both hemispheres.

**Remarks.** 1. The name *Merremia* was published for the first time by DENNSTEDT, Schlüss. Hort. Malab. (1818) p. 12, 23, 34 in the combination *Merremia convolvulacea*, a nomen nudum. DENNSTEDT based the species on a plate of RHEEDE's Hortus Malabaricus (vol. VIII,

tab. 27), where we also find a description. According to the International Rules of Nomenclature DENNSTEDT's name is not validly published. Later on, in 1893, HALLIER validated the name given by DENNSTEDT using it for a genus, distinguished by him, which genus contains besides *M. convolvulacea* (= *M. hederacea* (BURM. f.) HALL. f.) several other species. In the mean time the genera *Skinneria* and *Spiranthera* had been created, respectively by CHOISY (1833) and by BOJER (1837), each based on species afterwards removed to *Merremia* in the sense of HALLIER. Both names are, however, illegitimate and must be rejected, as there exists already a *Skinnera* FORST. (1776), a genus of *Onagraceae* and a *Spiranthera* ST. HIL. (1823), a genus of *Rutaceae*. Consequently the name *Merremia* DENNST. ex HALL. f. (1893) can be maintained.

2. A thorough monographical revision is necessary to get a good idea about the subdivision of the genus *Merremia*. For the time being, we accept the subdivision given by HALLIER, with some slight alterations. It is, however, possible that a further knowledge of the genus will lead to a new arrangement of the species. In that case it will be of importance to consider the types of HALLIER's sections as far as possible as the types of the sections in their new limitation. HALLIER subdivided the genus into the following sections:

a. *Skinneria* (CHOISY) HALL. f. in ENGL., Bot. Jahrb. XVI (1893) p. 552; id. in ENGL., Bot. Jahrb. XVIII (1894) p. 118 — *Skinneria* CHOISY in Mém. Soc. Phys. Genève VI (1833) p. 487; id. in DC., Prodr. IX (1845) p. 435; non *Skinnera* FORST. (1776). Type-species: *Merremia hirta* (L.) MERRILL (= *Skinneria caespitosa* (ROXB.) CHOISY).

b. *Streptandra* HALL. f. in ENGL., Bot. Jahrb. XVIII (1894) p. 114. Type-species: *Merremia tridentata* (L.) HALL. f.

c. *Xanthips* (GRISEB.) HALL. f. in ENGL., Bot. Jahrb. XVI (1893) p. 552; id. in ENGL., Bot. Jahrb. XVIII (1894) p. 112 — *Ipomoea* L. sect. *Xanthips* GRISEB., Fl. Brit. West Ind. Isl. (1864) p. 470. Type-species: *Merremia umbellata* (L.) HALL. f.

d. *Hailale* HALL. f. in ENGL., Bot. Jahrb. XLIX (1913) p. 379. Type-species: *Merremia peltata* (L.) MERRILL.

As to the names of these sections, *Skinneria* (CHOISY) HALLIER, based on the genus *Skinneria* CHOISY (1833) has to be rejected, as there exists already an earlier homonym *Skinnera* FORST. (1776), as said above. As the section *Skinneria* in the sense of HALLIER contains the type-species of the genus *Merremia*, *M. hederacea* (BURM. f.) HALL. f. (= *M. convolvulacea* DENNST.), I propose to change the name into Sect. *Eu-Merremia* VAN OOSTSTR., nom. nov. A fifth section,

c. *Wavula* VAN OOSTSTR., has been described by the author in Blumea III (1939) p. 266. Type-species: *Merremia similis* ELMER.

### Key to the species.

- 1a. Leaves palmately lobed to palmately compound with 5—7 segments or leaflets . . . . . 12
- b. Leaves neither palmately lobed nor compound . . . . . 2
- 2a. Pedicels with a thick lobed ring immediately below the calyx. Flowers large; sepals obovate to broad-elliptic or orbicular, obtuse or retuse, to 15—18 mm long; corolla c. 4 cm long . . . . . 22. *M. similis*
- b. Pedicels without thickened ring at apex . . . . . 3
- 3a. Leaves peltate (occasionally with exception of the leaves of the inflorescences) . . . . . 21
- b. Leaves never peltate . . . . . 4
- 4a. Midpetaline bands of corolla hairy externally or only at the top . . . 16
- b. Corolla completely glabrous externally . . . . . 5
- 5a. Flowers in axillary clusters or solitary in the leaf-axils; peduncle very short or nearly absent; pedicels short, 2—4 mm; sepals obovate to orbicular or subquadrate, outer ones obtuse with cucullate and distinctly mucronate top, 2.5—3 mm long, inner ones deeply emarginate, 3—4(—6) mm long, all long ciliate at the margins and hairy on the back; corolla not exceeding 10 mm, yellow, the midpetaline bands with dark lines. Leaves kidney-shaped to broad-ovate. Prostrate herb . . . . . 5. *M. emarginata*
- b. Peduncles longer . . . . . 6
- 6a. Sepals 10 mm or mostly shorter . . . . . 7
- b. Sepals longer than 10 mm . . . . . 18
- 7a. At least the inner sepals acute, attenuate-acuminate into a slender point. Leaves of various forms (see Fig. 2, J—O) . . . . . 6. *M. tridentata*
- b. Sepals obtuse . . . . . 8
- 8a. Twining or prostrate, herbaceous or rarely woody plants. Midpetaline bands of corolla with distinct dark lines . . . . . 9
- b. Larger woody twiners. Midpetaline bands of corolla without distinct dark lines . . . . . 17
- 9a. Sepals slightly unequal in length. Outer sepals broadly obovate to orbicular or broadly spatulate, concave . . . . . 10
- b. Sepals unequal in length. Outer sepals shorter, elliptic, to oblong-elliptic or oblong, less concave or flat . . . . . 11
- 10a. Outer sepals broadly obovate to orbicular, emarginate, not or slightly mucronulate, generally hairy, 4—7 mm long; inner ones 6—8 mm (Fig. 1, g). Corolla 1.5—2 cm long, yellow. Capsule depressed-globose, valves coarsely wrinkled (Fig. 1, h). Petiole generally without tubercles . . . 1. *M. gemella*
- b. Outer sepals generally glabrous, 3.5—4 mm long, broadly obovate to spatulate, broadly notched at the apex and distinctly mucronulate; mucro directed outward; inner sepals to 5 mm long (Fig. 1, c). Corolla 1 cm or less, yellow. Capsule depressed-globose or broadly conical, somewhat 4-angular, less coarsely wrinkled (Fig. 1, f). Petiole often with small tubercles . . . 2. *M. hederacea*
- 11a. Outer sepals elliptic, 3—4 mm long, inner ones oblong or elliptic, 4.5—6 mm

- long. Corolla 1.5—2 cm long, pale yellow or whitish. Capsule broad-ovoid to globular, smooth (Fig. 1, k). Peduncles filiform; bracts of inflorescence minute, 1—2 mm. Leaves variable in form, linear, linear-oblong, oblong-lanceolate, oblong to ovate-oblong or ovate (Fig. 2, P—Z); the base rounded, truncate, cordate or hastate . . . . . 3. *M. hirta*
- b. Outer sepals oblong or oblong-elliptic, 4 mm long, inner ones broad-ovate or orbicular, 6 mm long. Corolla c. 1.8 cm long, white. Capsule subglobular, the valves reticulately wrinkled (Fig. 1, e). Peduncles thicker, bracts of inflorescence larger, to 4 mm long. Leaves larger, ovate (Fig. 1, b); the base cordate. . . . . 4. *M. dichotoma*
- 12a. Peduncles glandular in the upper part. Sepals narrow-ovate to oblong, obtuse, to 8 mm long. Corolla pale yellow, 2.5 cm long or less. Leaves palmately compound, with 5 leaflets . . . . . 7. *M. quinquefolia*
- b. Peduncles glabrous or hairy, but not glandular. Sepals much longer, corolla larger . . . . . 13
- 13a. Leaves palmately compound of 5 entire leaflets. Stems, peduncles, pedicels and outer sepals patently hirsute. Outer sepals ovate-lanceolate, acute or acuminate, 15—25 mm long. Corolla white, 2.5—3.5 cm long. Cultivated species . . . . . 9. *M. aegyptia*
- b. Leaves palmately lobed or divided, sometimes nearly to the base, not palmately compound . . . . . 14
- 14a. Plant completely glabrous. Leaves palmately divided to far below the middle with 7 entire, oblong-lanceolate segments. Outer sepals ovate to broad-ovate, obtuse, 23—25 mm long. Corolla yellow, 5.5 cm long . . . . . 8. *M. tuberosa*
- b. Plants hairy . . . . . 15
- 15a. Leaves palmately divided nearly to the base, segments 5—7, lanceolate, coarsely dentate to irregularly pinnately lobed. Peduncles patently hirsute, pedicels glabrous. Sepals ovate-lanceolate, acute, glabrous, 20—25 mm long. Corolla white with a rose or purple throat, 3—3.5 cm long. Cultivated species . . . . . 10. *M. dissecta*
- b. Leaves palmately 5—7-lobed; lobes broad-triangular to lanceolate, coarsely dentate to crenate or subentire. Peduncles, pedicels and outer sepals patently hirsute. Sepals oblong or ovate-oblong, obtuse or acutish, 12—20 mm long. Corolla yellow, to 5—6 cm long . . . . . 11. *M. vitifolia*
- 16a. Corolla pilose at the upper parts of the midpetaline bands, white or yellow to orange, 2—3.5 cm long. Sepals broad-elliptic to orbicular, emarginate, 5—8 mm long. Inflorescences generally with short pubescent peduncles, mostly cymosely branched at the apex with short to very short branches, flowers consequently in umbelliform cymes, sometimes flowers solitary . . . . . 12. *M. umbellata*
- b. Midpetaline bands of corolla densely sericeous outside; corolla white or yellow, c. 2 cm long. Outer sepals orbicular to transverse elliptic, broadly obtuse to retuse, 5—7 mm long, inner ones broadly transverse elliptic. Inflorescences with long peduncles, corymbosely ramified near the top . . . . . 13. *M. Boissiana*
- 17a. 2 Outer sepals broad-oblong, 7 mm long, 3 inner ones broadly elliptic to orbicular, 8—9 mm long; corolla yellow, 1.5 cm long. Leaves ovate to broad-ovate, base rounded; nerves 5—6 on each side of midrib. Woody twiner with slender stems . . . . . 18. *M. Clemensiana*

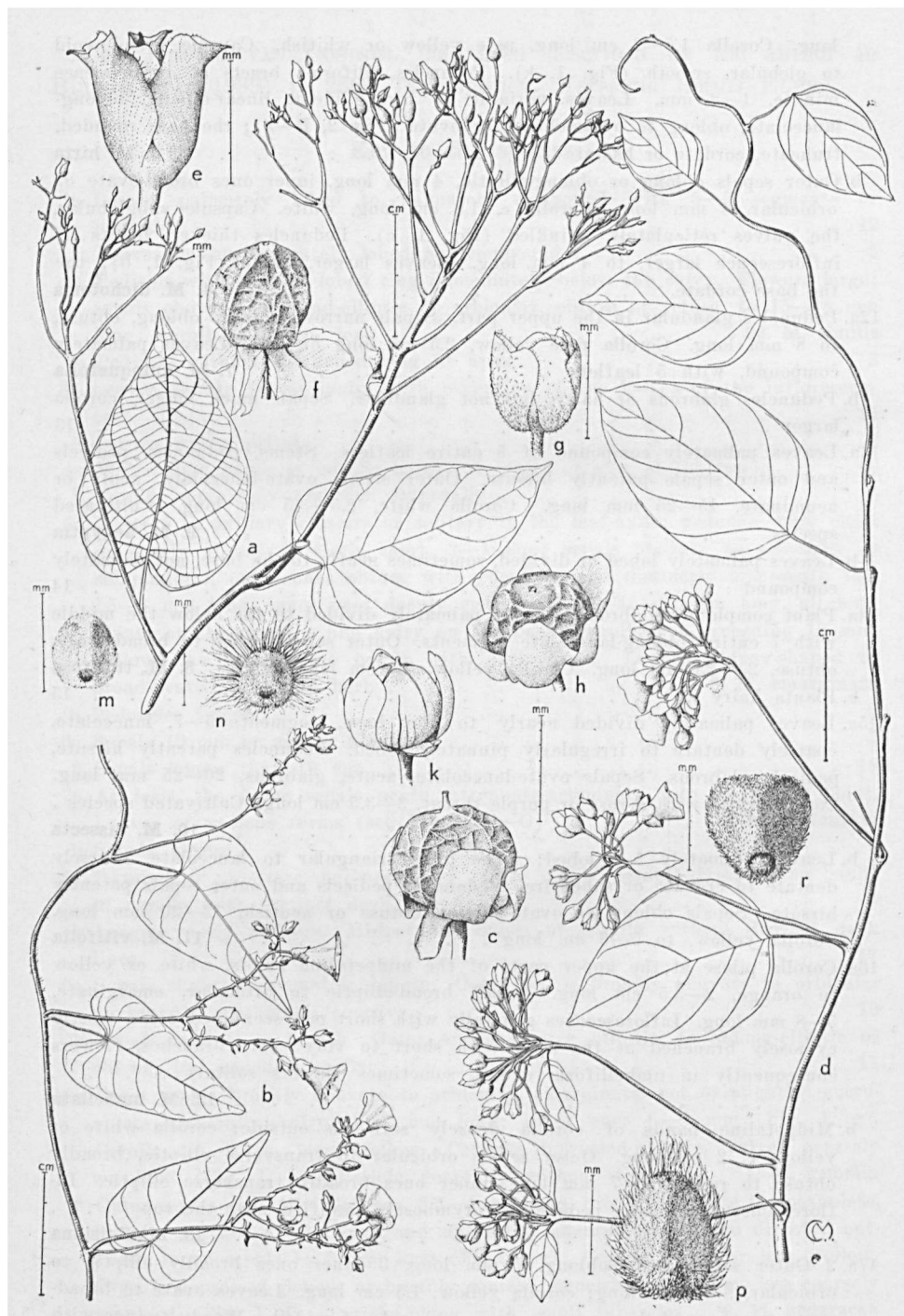


Fig. 1.

- b. Sepals broad-elliptic to orbicular, outer ones 9—10 mm long; corolla yellow, 2—2.5 cm long. Leaves broad-ovate to orbicular, nerves 7—10 on each side of midrib. Woody twiner, stems thicker . . . . . 19. *M. Korthalsiana*
- 18a. Sepals 11—12 mm, outer ones broad-elliptic, inner ones broad-elliptic to orbicular; corolla c. 2.5 cm long. Flower-buds conical, acute. Leaves ovate, cordate at base, nerves impressed above, very prominent beneath. Woody twiner; stems lenticellate . . . . . 17. *M. crassinervia*
- b. Sepals longer, 18 mm or more . . . . . 19
- 19a. Corolla large, white, 7—8 cm long. Sepals large, the outer ones broad-ovate to broad-elliptic, inner ones narrower, 25—30 mm long. Stems herbaceous, smooth. Cultivated; probably occasionally escaped from culture . . . . . 14. *M. mammosa*
- b. Corolla smaller . . . . . 20
- 20a. Leaves orbicular to broad-ovate, apex cuspidate, base cordate; 8—10 nerves on each side of midrib. Sepals elliptic to broad-elliptic, 18—22 mm long; corolla 5.5—6 cm long. Stems woody, lenticellate . . . . . 15. *M. borneensis*
- b. Leaves ovate, apex acuminate, base cordate; 6—7 nerves on each side of midrib. Sepals oblong or elliptic-oblong, 25—28 or the inner ones to 30 mm long; corolla 6 cm long. Stems woody, sparsely lenticellate . . . . . 16. *M. pulchra*
- 21a. Sepals less than 15 mm long; corolla 3—3.5 cm long . . . . . 21. *M. Elmeri*
- b. Sepals 18—25 cm long; corolla 4.5—6 cm long . . . . . 20. *M. peltata*

### Section 1. *Eu-Merremia* VAN OOSTSTR. nov. nom.

*Skinneria* CHOISY in Mém. Soc. Phys. Genève VI (1833) p. 487; id. in DC., Prodr. IX (1845) p. 435, non *Skinnera* FORST. (1776) — *Merremia* DENNST. ex HALL. f. sect. *Skinneria* (CHOISY) HALL. f. in ENGL., Bot. Jahrb. XVI (1893) p. 552; id. in ENGL., Bot. Jahrb. XVIII (1894) p. 118.

Flower-buds oblong, elliptic or globular, obtuse; midpetaline bands of the corolla in dried state always with 5 dark lines; flowers rather small or small.

1. *Merremia gemella* (BURM. f.) HALL. f. in ENGL., Bot. Jahrb. XVI (1893) p. 552; id. in Versl. 's Lands Plantent. 1895 (1896) p. 132; id. in Bull. Herb. Boiss. V (1897) p. 380; id. in Meded. 's Lands Plantent. XIX (1898) p. 544; BOERL., Handl. Fl. Ned. Ind. II (1899)

Fig. 1, a: *Merremia crassinervia* VAN OOSTSTR., branch of the type (L); b: *M. dichotoma* VAN OOSTSTR., branch of the type (B); c: *id.*, capsule; d: *M. Clemensiana* VAN OOSTSTR., branch of the type (B); e: *M. hederacea* (BURM. f.) HALL. f., calyx; f: *id.*, capsule; g: *M. gemella* (BURM. f.) HALL. f., calyx; h: *id.*, capsule; k: *M. hirta* (L.) MERRILL, capsule; m: *M. hederacea* (BURM. f.) HALL. f., f. *pubescens* VAN OOSTSTR., seed; n: *id.*, f. *barbata* VAN OOSTSTR., seed; p: *M. umbellata* (L.) HALL. f. var. *orientalis* HALL. f., seed; r: *id.*, var. *occidentalis* HALL. f., seed.

p. 510; MERRILL in Philipp. Journ. Sc. I (1906) Suppl. p. 120; HALL. f. in VALETON, Pl. Pap. in Bull. Dep. Agric. Ind. Néerl. X (1907) p. 50; id. in Meded. Rijks Herb. Leiden 12 (1912) p. 14; KOORDERS, Exk. fl. Java III (1912) p. 112; HALL. f. in ENGL., Bot. Jahrb. XLIX (1913) p. 378; KOORD.-SCHUM., Syst. Verz. (1910—13), Conv. p. 2; id. (1914) p. 109; BOLD., Zakfl. Java (1916) n. 834; MERRILL in Philipp. Journ. Sc. XIX (1921) p. 374; id. in Journ. Roy. As. Soc. Str. Br. Spec. Numb. (1921) p. 508; id., Enum. Philipp. Fl. Pl. III (1923) p. 360; BACKER, Onkruidfl. Jav. Suikerrietgr. (1931) p. 519 — *Convolvulus gemellus* BURM. f., Fl. Ind. (1768) p. 46, t. 21, fig. 1 — ? *C. striatus* VAHL, Symb. Bot. III (1794) p. 28 (type not seen) — *Ipomoea gemella* (BURM. f.) ROTH, Nov. Pl. Sp. (1821) p. 110 (not seen); CHOISY in Mém. Soc. Phys. Genève VI (1833) p. 469; id. in DC., Prodr. IX (1845) p. 380; ZOLL., Syst. Verz. 2. Heft (1854) p. 129; MIQ., Fl. Ned. Ind. II (1857) p. 616; F.-VILL., Novis. App. (1880) p. 142 (not seen) — *I. radicans* BL., Bijdr., (1825) p. 712, non BERT. — *I. polyantha* Miq., Fl. Ned. Ind. II (1857) p. 613; CLARKE in Hook., Fl. Brit. Ind. IV (1883) p. 206; PRAIN in Journ. As. Soc. Bengal LXIII (1894) p. 105; GAGNEP. et COURCH. in LEC., Fl. Indo-Chine IV (1915) p. 256; non *Convolvulus polyanthus* WALL. — *I. cymosa* (DESR.) R. et S. var. *radicans* (BL.) Miq., Fl. Ned. Ind. II (1857) p. 613 — ? *I. flava* MUELL. in BENTH., Fl. Austr. IV (1869) p. 424 (type not seen). Fig. 1, g—h.

A prostrate or twining herb, the stems to 3.00 m long (BACKER), 1—2 mm thick, covered with rather long, grey or white, curled, more or less appressed or sometimes patent hairs, especially at the nodes, afterwards glabrescent, sometimes already glabrous in youth; prostrate stems often rooting, roots at the nodes but also at the internodes. Leaves usually ovate or broad-ovate, rarely narrow-ovate to oblong in outline, in one case broad-ovate to kidney-shaped with broadly rounded apex (ELBERT 365, Java, Madioen, Trinil); the apex usually acuminate or gradually attenuate, the point obtuse or acute, mucronulate, sometimes slightly retuse; the base broadly cordate; the margin entire or coarsely crenate to dentate, sometimes 3-lobed; the leaf-blade glabrous on both sides or glabrous above and pilose beneath on the nerves or pilose on the nerves on both sides, occasionally pilose on both sides over the whole surface; the density of the hairs can vary to a great extent; the hairs are of the same kind as those on the stems; length of the blade 2.5—12 cm, width 1.5—10 cm; the petiole shorter than the blade or as long as it, with appressed hairs like those of the blade; length of the petiole 1.5—6, sometimes to 10 cm. Peduncles axillary, mostly covered



with short curled hairs or glabrous, variable in length, 2.5—10, occasionally to 16 cm long, cymosely branched at the apex with one or with two dichasial ramifications, the terminal branches of the dichasium in the latter case often monochasial; pedicels with the same hairs as the peduncle, 3—6 mm long; bracts minute, deciduous. Flower-buds ovoid to globose, obtuse. Sepals thin-coriaceous with scarious margin, slightly unequal, the 2 outer and shorter ones more or less hairy over the whole length and sometimes at the margin, or only near the base or at the margin, or quite glabrous; the 3 inner and longer ones glabrous or sometimes hairy in the middle part, with glabrous margins; the sepals are strongly concave especially in bud, they are broadly obovate to orbicular, emarginate at the apex and crowned by a minute mucro, which may be absent; the outer sepals are 4—7 mm long, the inner ones 6—8 mm, in poorly developed specimens they are sometimes only about 4 mm long; the sepals are slightly enlarged in fruit. Corolla campanulate to funnel-shaped, glabrous, 1.5—2 cm long, yellow (sulphur yellow, pale yellow) with 5 distinctly 5-nerved midpetaline bands, the nerves are pellucid in living specimens (according to BACKER), in dried specimens they are dark-coloured; the limb of the corolla is slightly 5-lobed, the lobes are slightly emarginate and minutely mucronate. Disk annular. Filaments filiform, broadened and hairy at the base, the margins decurrent on the corolla; length 10—11 mm. Ovary ovoid, glabrous; style filiform, glabrous, c. 11 mm long; stigma biglobular, papillose. Capsule depressed-globose, coarsely wrinkled in dried specimens, glabrous, about 7 mm high, 2-celled, 4—1-seeded. Seeds dark grey or brownish puberulent, trigonous or when only one seed develops globose.

MALAY PENINSULA, Perlis, Kangar, HENDERSON, Singapore Field n. 22911, Nov. 1929 (B, S).

JAVA, according to BACKER from West to East Java, in the lower parts on moist soil, on bushes and hedges. Without precise locality, JUNGHUIN 38 (L); KORTHALS 275 (L); Batavia, Batavia, without collector's name, June 1846 (K); id. in herb. BURMAN, *type of Convolvulus gemellus* BURM.f. (Genève); id., PIEPERS s.n. (B); id., BLUME 1123, *type of Ipomoea radicans* BL. (L); E. of Batavia, in forest, DE LA SAVINNIERRE 1167, Aug. 1878 (K); along railroad between Batavia and Tandjong Priok, BACKER 34294, May 1903 (B); Weltevreden, BACKER 34293 (B); N. of Weltevreden, Chinese churchyard, on *Carissa*, HALLIER s.n., Aug. 1896 (B, L, U); Sabangan, BAKHUIZEN VAN DEN BRINK fil. 3453, Sept. 1924 (B, L); Bidara tjina, EDELING? s.n. (B); Alkmaar, dike of rice fields, MOUSSET 436 (B); Buitenzorg, Buitenzorg, 250 m, BAKHUIZEN VAN DEN BRINK fil. 1942, Oct. 1922 (B); id., BAKHUIZEN VAN DEN BRINK fil. 2258, Febr. 1923 (B); cultivated in the Botanic Garden, n. 233 (L); Cheribon, Losarang, BACKER 16762, Sept. 1914 (B); between Tjipoenagara and Haoergeulis, bushes, common, 25 m, BACKER 16832, Oct. 1914 (B); Pekalongan,

between Pekalongan and Pemalang, wayside, c. 3 m s.m., BACKER 15666, Sept. 1914 (B); near Soebah, KOORDERS 36979  $\beta$ , June 1899 (B); id., KOORDERS 37004  $\beta$ , May 1899 (B); Brebes, dikes of rice fields, 5 m s.m., BACKER 15296, Sept. 1914 (B); between Soebah and Weleri (Semarang), bushes, 50 m, BACKER 16562, Sept. 1914 (B); Banjoemas, Rawah apoe opposite Kali Poetjang, damp grassland, c. 10 m, BACKER 4481, Sept. 1912 (B); Kedoe, near Awoe-awoe, in grassy fields, JUNGHUIN 29, May (L); Semarang, Semarang, DOCTERS VAN LEEUWEN s.n., July 1910 (B); Kendal, dry wayside, 5 m, BACKER 16320, Sept. 1914 (B); Mount Oengaran, HORSFIELD s.n. (L; U, type of *Ipomoea polyantha* MIQ.); virgin forest G. Woelan, near Kedoeng djati, KOORDERS 24506  $\beta$ , Sept. 1896 (B); Karangasen, Kedoeng djati, KOORDERS 28238  $\beta$ , June 1897 (B, L); Tempoeran, teak-wood, DOCTERS VAN LEEUWEN s.n., May 1909 (B); near Grobogan, KOORDERS 28236  $\beta$ , June 1897 (B); id., DE BOER 18, May (B); sugar factory Trangkil near Tajoe, HOUWING, herb. Koedoes n. 711 (Pa); sugar factory Langsec, without collector's name (Pa); Djapara-Rembang, Ngarengan, teak-wood, 50 m, KOORDERS 35608  $\beta$ , June 1899 (B); Pasokan, KOORDERS 32916  $\beta$ , June 1899 (B); Blora, border of rice field, frequent, c. 100 m, BEUMÉE s.n., June 1917 (B); Koendoeran, teak-wood, c. 100 m, BEUMÉE 5232, Aug. 1920 (B); Bokotoek, teak-wood, c. 60 m, BLOKHUIS s.n. (B); Padangan, Wadeng, teak-wood, clearings, common, c. 100 m, BEUMÉE 991, Aug. 1917 (B); Soerakarta, Klaten, 180 m, LEEFMANS 133 (B); Jogjakarta, Blitaran, JUNGHUIN 40 (L); Madioen, Madioen, 70 m, KOORDERS 23364  $\beta$ , June 1896 (B); Ketapang, 5—25 m, hedges, common, BACKER 21147, July 1915 (B); Karanganjer, Ngawi, common, clearings, on limestone, 150 m, STOUTJESDIJK 34, June 1921 (B); Kendeng, Trinil, 50—150 m, ELBERT 365 (L); sugar factory Soedhono, S. of Ngawi, COERT s.n., June 1925 (Pa); sugar factory Poerwodadi, c. 175 m, COERT 13, Apr. 1927 (Pa); Kediri, N. Kediri, Ngrajoeng, teak-wood, 125 m, GRUTTERINK 3062, June 1918 (B); id., id., DEN BERGER 476, Aug. 1918 (B); id., Toengloer, teak-wood, frequent, 125 m, WIND 2562, Apr. 1918 (B); id., id., teak-wood, 125 m, WIND 2528, Apr. 1918 (B); Soerabaja, Soerabaja, DORGEOLO 427, 459, May 1922 (Pa); Wonokromo, VAN SLOOTEN 2061, Sept. 1928 (B); Djombang, without collector's name (Pa); sugar factory Ngelom near Djombang, BOVIEN, herb. Djombang n. 67, Sept. 1923 (Pa); Djombang, Toenggodono hills, BOVIEN, herb. Djombang n. 4, Sept. 1923 (Pa); S. Soerabaja, Pakis, teak-wood on red volcanic soil, c. 100 m, WOLFF VON WÜLFING 2309, Apr. 1918 (B); Malang, Pasoerocan, banks of river, 3 m s.m., BACKER 7679, May 1913 (B); G. Baoeng near Lawang, 400 m, BIJHOUWER 76, Aug. 1932 (B); Besoeki, Djember, ULTÉE 10 (B); alang field near Poeger, Watangari, common, 10 m, KOORDERS 21079  $\beta$ , Oct. 1895 (B, L).

BORNEO, S. and E. division, Bandjermasin, KORTIALS 231 (L); W. Koetai, near Mocara Kaman, on padang, ENDERT 1480, June 1925 (B); Long Wahau, SCHLECHTER 13399, July 1901 (BD); Sarawak, Baram district, Baram, ROSE 274, Oct. 1894 (K); British North Borneo, CLEMENS 11244 (according to MERRILL, 1921).

CELEBES, Manado, Manado, sea level, on fertile volcanic sand, KOORDERS 16556  $\beta$ , Dec. 1894 (B, L); near Amoerang, KOORDERS 16553  $\beta$ , March 1895 (B, L); id., KOORDERS 16554  $\beta$ , Apr. 1895 (B, BD, K, L); bank of Lake Tondano, marshes, 700 m, KOORDERS 16555  $\beta$ , Jan. 1895 (B, L); near Gorontalo, in rice fields, FORSTER 90 (L); Bocol, SARASIN 686, Aug. 1894 (BD); Celebes and Dependencies, Loewoe, Palopo, marshy soil, KJELLBERG 1947, 1948, July 1929 (B); Bone, Pampa-

noca, NOERKAS 88 (exped. VAN VUUREN), March 1912 (B, L). Celebes, Lagi-lagi, RACHMAT 261 (exped. VAN VUUREN), July 1913 (B, L); Parampe, RACHMAT 309 (exped. VAN VUUREN), July 1913 (B).

LOMBOK, Rindjani, S.S.E. slope, Pingabaya, 50—75 m, ELBERT 2053, June 1909 (L).

SOEMBAWA, W. Soembawa, 50 m, DE VOOGD 2562, June 1936 (B); Dompoe, dry bushes, common, 80 m, Mrs. RENSCH 795, May 1927 (B).

NEW GUINEA, Dutch New Guinea, Merauke, KOCH s.n., Aug. 1904 (B, L); id., along field, VERSTEEG 1918, Oct. 1907 (B); Territory of New Guinea, mouth of Markham River, WEINLAND 200 (BD, mixed with *Ipomoea gracilis* R. Br.; L); Papua, Laloki river, open places, c. 150 ft., CARR 12936, Aug. 1935 (L); road to Rouna, wayside, c. 250 ft., CARR 12319, May 1935 (L).

PHILIPPINE ISLANDS, according to MERRILL common in thickets at low altitudes. Luzon: Cagayan, Ilocos Norte, Ilocos Sur, Abra, Union, Nueva Vizcaya, Pangasinan, Bataan, Rizal, Laguna; Mindoro; Mindanao: Lanao, Cotabato. Luzon, without precise locality, CUMING 615 (BD, K); Central Luzon, LOHER 4125 (K); id., LOHER 4128 (BD, K); id., LOHER 4129 (K); id., San Francisco del Monte, LOHER 4126 and 4127, Dec. 1893 and Febr. 1891 (K); Prov. Ilocos Norte, Bangui, RAMOS, Bur. of Sc. 27606, Febr.-March 1917 (B); Cagayan Prov., BACANI, For. Bur. 16477, Jan. 1909 (BD); Prov. of Union, Bauang, ELMER 5577, Febr. 1904 (BD, K); Prov. of Nueva Vizcaya, vic. of Dupax, MCGREGOR, Bur. of Sc. 11439, March-Apr. 1912 (BD, K, L, P); Prov. of Pampanga, Arayat, MERRILL 1440, March 1903 (BD); Prov. of Bataan, Mt. Mariveles, Lamao River, WILLIAMS 353, Dec. 1903 (K); id., id., MEYER, For. Bur. 2502, Jan. 1905 (B, BD, K); id., id., BORDEN, For. Bur. 2714, Febr. 1905 (B, BD, K); Prov. of Rizal, Manila, GAUDICHAUD 187 (also numbered 181†) and 188 (on one sheet), Nov. 1836 (P, mixed with *Merremia hirta* (L.) MERRILL); id., id., VIDAL 476 (K); id., id., MERRILL 644, Jan. 1903 (BD, K, S); id., Pateros, MERRILL 298, Dec. 1909 (U); Prov. of Laguna, Mabesa, For. Bur. 26757, Febr.-Apr. 1917 (S); id., Los Baños, without collector's name, 2774, Jan. 1914 (S); id., Los Baños, Mt. Maquiling, ELMER 18477, June-July 1917 (B, BD, K, L, U); Mindanao, Lake Lanao, Camp Keithley, Mrs. CLEMENS s.n., Jan. 1907 (BD).

Distribution: S.E. Asia, Malay Archipelago, Philippines, New Guinea and trop. Australia.

Vernacular names: lawattan (Sund., MIQUEL); tatapajan (Sund., HALLIER); lamatan, lawatan, rawatan (Jav., KOORDERS); lawatan koening (KOORDERS); sampar kidang (Jav., KOORDERS); indjèn indjèn (Jav., KOORDERS); tjoejigan (BACKER); keritang tikoes (Koetai, Borneo, ENDERT); wale-in-sengit, amoet peror (Celebes: Tontemboan language, KOORDERS); katama (Celebes: Toelooer language, erroneously, according to KOORDERS); beloka (Celebes, Lagi-lagi, RACHMAT); djonge djonge (Celebes, Parampe, RACHMAT); bangbañgau, marakamóte (Philipp.: Iloco language, MERRILL); kamokamotíhan (Philipp.: Pangasinán language, MERRILL); talanuk (Philipp.: Tagalog language, MERRILL).

Remarks: Some specimens differ from typical ones by the

possession of a few small tubercles on the petiole, just as they are found in *M. hederacea* (BURM. f.) HALL. f.

JAVA, Buitenzorg, Buitenzorg, cultivated in the Botanic Garden n. XV.KB. XIII.4 (B); Malang, Bangil, VAN STEENIS 7216, June 1935 (B, mixed with *M. emarginata* (BURM.f.) HALL.f.).

PHILIPPINE ISLANDS, Luzon, prov. Rizal, RAMOS, Bur. of Sc. 1988, Nov. 1914 (B, BD, L, P, S).

Specimens collected by BRASS in Papua have remarkably large corollas; in the specimen BRASS 7578 (L) they have a length of 3—3.5 cm:

var. *splendens* VAN OOSTSTR., nov. var.

Differt corollis majoribus ad 3—3.5 cm longis.

NEW GUINEA, Papua, Lake Daviumbu, Middle Fly River, in savannahs, on grass and borders of undergrowth of rain forest, BRASS 7578, Aug. 1936 (L, type). Presumably the following specimens also belong here: Lake Daviumbu, Middle Fly River, rain forest, common on lake-shores and river-banks, BRASS 7646, Sept. 1936 (L); id., common on river-banks and in reed swamps, BRASS 7778, Sept. 1936 (L).

Distribution: New Guinea.

2. *Merremia hederacea* (BURM. f.) HALL. f. in ENGL., Bot. Jahrb. XVIII (1894) p. 118; id., in Versl. 's Lands Pl.t. 1895 (1896) p. 126; KOORDERS, Exk. fl. Java III (1912) p. 112; BOLD., Zakfl. Java (1916) n. 837; MERRILL in Philipp. Journ. Sc. XIX (1921) p. 374; id. in Journ. Roy. As. Soc. Str. Br., Spec. Numb. (1921) p. 508; id., Enum. Philipp. Fl. Pl. III (1923) p. 361; id. in Univ. Calif. Publ. Bot. 15 (1929) p. 260 — *Evolvulus hederaceus* BURM. f., Fl. Ind. (1768) p. 77, t. 30, fig. 2 — *Convolvulus acetosellaefolius* DESR. in LAMK., Encycl. III (1789) p. 564 — *C. dentatus* VAHL, Symb. Bot. III (1794) p. 25; WALL., Cat. (1828) n. 1349; ROXB., Fl. Ind. I (1832) p. 477 (*C. dentatus* WILLD.) — *C. flavus* WILLD., Spec. Pl. I (1797) p. 852 — *Merremia convolvulacea* DENNST., Schlüss. Hort. Mal. (1818) p. 12, 23, 34, nomen nudum; HALL. f. in ENGL., Bot. Jahrb. XVI (1893) p. 552; BOERL., Handl. Fl. Ned. Ind. II (1899) p. 510; BAKER and RENDLE in THIS-DYER, Fl. Trop. Afr. IV, 2 (1905) p. 114; PRAIN in Journ. As. Soc. Bengal LXXIV (1906) p. 305; RIDLEY, Fl. Malay Penins. II (1923) p. 458; HENDERSON in Gard. Bull. Str. Settle. IV (1928) p. 293 — *Ipomoea chryseides* KERGAWL. in Bot. Reg. (1818) t. 270; CHOISY in Mém. Soc. Phys. Genève VI (1833) p. 469; WIGHT, Icon. I (1840) t. 157 (*I. chrysoïdes*); SPANOGHE in Linnæa XV (1841) p. 339; CHOISY in DC., Prodr. IX (1845) p. 382; ZOLL., Syst. Verz. 2. Heft (1854) p. 129 (*I. chrysoïdes*); MIQ., Fl. Ned. Ind. II (1857) p. 616; BENTH., Fl. Austr. IV (1869) p. 423; CLARKE in HOOK., Fl. Brit. Ind. IV (1883) p. 206; FORBES, Wander., Germ. ed. II (1886) p. 222; VIDAL y SOLER, Rev. Plant. Vasc.

Philipp. (1886) p. 196; v. MUELLER, Descr. Notes Pap. Pl. IX (1890) p. 64; TRIMEN, Handb. Fl. Ceyl. III (1895) p. 219; MANSON BAILEY, Queensl. Fl. IV (1901) p. 1064; GAGNEP. et COURCH. in LEC., Fl. Indo-Chine IV (1915) p. 254 — *I. dentata* WILLD. ex R. et S., Syst. IV (1819) p. 789 — *Convolvulus chryseides* (KER.-GAWL.) SPRENG., Syst. I (1825) p. 598 — *C. lapathifolius* SPRENG., Syst. I (1825) p. 604 — *Lepistemon muricatum* SPANOGHE in Linnæa XV (1841) p. 339 — *Ipomoea zebrina* PERR. ex CHOISY in DC., Prodr. IX (1845) p. 382 — *I. acetosellaefolia* (DESR.) CHOISY in DC., Prodr. IX (1845) p. 383; MIQ., Fl. Ned. Ind. II (1857) p. 618 — *I. subtriflora* ZOLL. et MOR. in MOR., Syst. Verz. ZOLL. (1846) p. 51 — *Merremia chryseides* (KER.-GAWL.) HALL. f. in ENGL., Bot. Jahrb. XVI (1893) p. 552; COOKE, Fl. Bomb. II (1905) p. 238; DURRUE, Fl. Upper Ganget. Pl. II (1911) p. 109; GAMBLE, Fl. Pres. Madras V (1923) p. 929. Fig. 1, c—f, m—n.

Herb with twining or prostrate stems, the prostrate ones rooting at the nodes or sometimes at the internodes, to 2 mm thick, mostly thinner, slender, terete, finely striate, smooth or sparsely and minutely tuberculate, glabrous or sparsely hirsute especially at and above the nodes. Leaves ovate in outline, the margin entire or crenate to obscurely or deeply 3-lobed, in the latter case the middle lobe mostly contracted at the base, the lateral lobes broadly rounded, entire or crenate; the apex of the leaf mostly obtuse, mucronulate, the base broadly cordate; surfaces glabrous or sparsely hairy; length 1.5—5 cm, breadth 1.2—4 cm; petiole slender, 0.5—6 cm, with a few small tubercles, especially in the basal half. Inflorescences axillary; peduncles thicker than the petioles, shorter than or exceeding the leaves, 1—10 cm long, terete at their base, often angular at the top, mostly glabrous, smooth or occasionally minutely tuberculate; flowers 1 or few to several, in the latter cases the primary ramification dichasial with a terminal flower, the sequent ramifications often monochasial; bracts narrow-obovate, mucronulate, 3 mm long, deciduous; pedicels 2—4 mm long, smooth or minutely tuberculate. Flower-buds oblong to broad-elliptic, obtuse. Sepals concave, broadly obovate to spatulate, broadly notched at the apex, distinctly mucronulate, mucro directed outward, "giving the cyme a squarrose aspect" (BENTHAM, Fl. Austr. l.c.), quite glabrous or occasionally with a few hairs on the back and along the margins; two outer sepals 3.5—4 mm long, inner ones to 5 mm long. Corolla yellow, campanulate, 6—10 mm long, with 5 distinctly 5-nerved midpetaline bands, glabrous outside, inside with a few long hairs near the base of the filaments. Filaments inserted near the corolla base, filiform, slightly

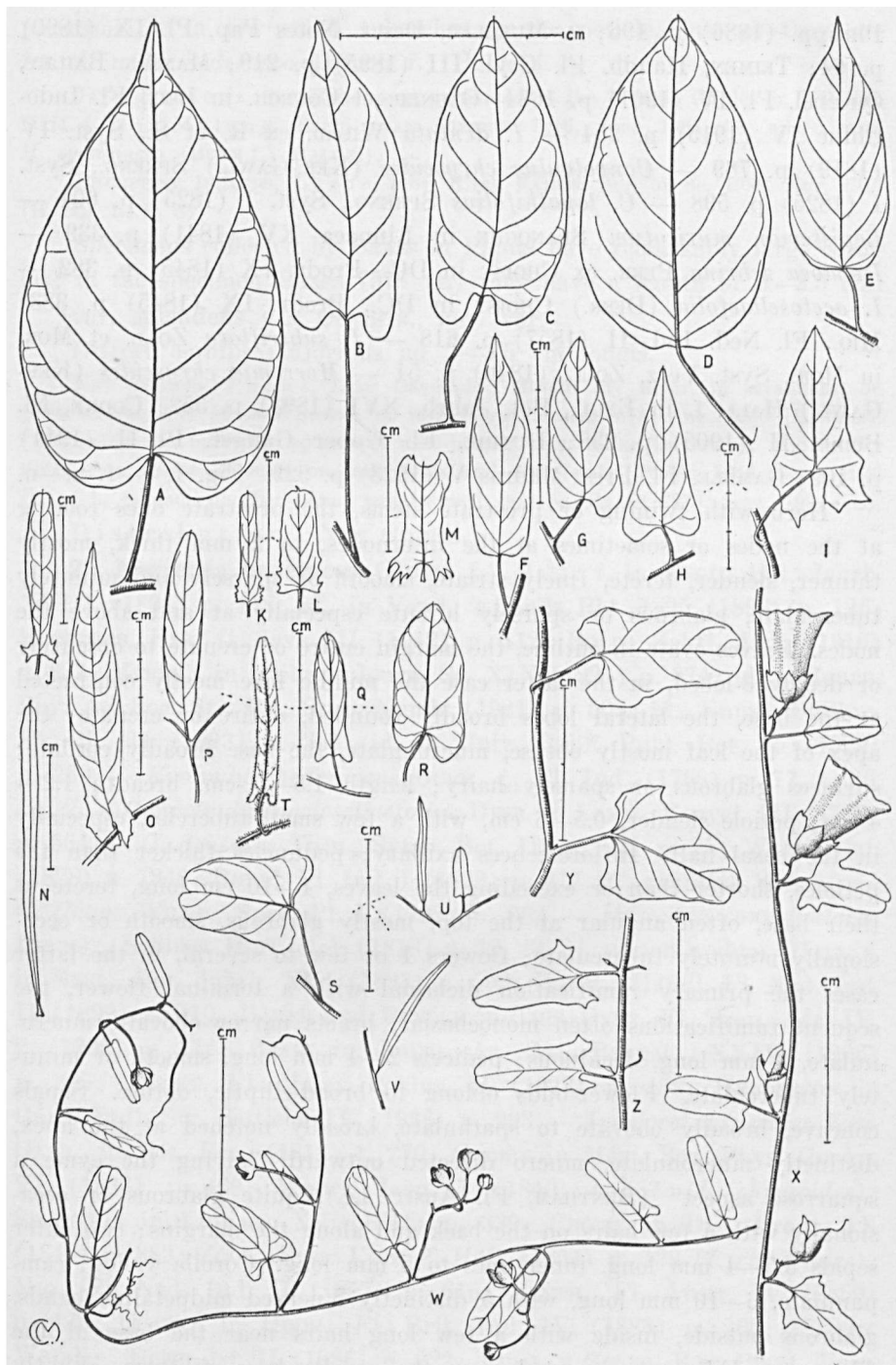


Fig. 2.

dilated and long hairy at the base, 6—8.5 mm long. Ovary broadly conical, glabrous; style filiform, about 9 mm long; stigma biglobular, papillose. Capsule broadly conical to depressed-globular, somewhat 4-angular, about 5—6 mm high, 4-valved, the valves transversely or reticulately wrinkled, less coarsely than in *M. gemella*. Seeds mostly 4, short-pubescent or short-pubescent and with long reddish brown or fulvous hairs at the hilum and along the margins, sometimes also on the sides (see Remarks), 2.5 mm long.

MALAY PENINSULA, according to RIDLEY, a weed of cultivation and common on sand-banks; known from Prov. Wellesley, Perak, Kelantan, Selangor, Pahang, Johor and Singapore. Kelantan, Kota Bahru, YAPP 259 (K); Gua Ninik, HENDERSON, Singapore Field n. 19617, Oct. 1927, *p*<sup>1)</sup> (B, S); Channing, RIDLEY s.n., Febr. 1917, *p* (K); Prov. Wellesley, Prye Dock, CURTIS 2210, Jan. 1890 (S); Perak, SCORTECHINI s.n., *p* (S); Ipoh, BURKILL, Singapore Field n. 2784 (S); Changkat Mentri, KLOSS 6481, Sept. 1918 (K); Pahang, RIDLEY 2168a, *p* (S); Kuala Tahan, SEIMUND 14, Nov. 1920 (S); Khol, Tembeling River, RIDLEY 2168 (S); Pahang River, RIDLEY s.n., Aug. 1891 (S, fasciation); Selangor, road from Kuala Lumpur, on bushes, RIDLEY s.n., Dec. 1920 (K); Johore, Serom, RIDLEY s.n. (S); Sungai Tukong Estate, GORDON SPARE 1000, Jan. 1932, *p* (S); Kota Tinggi Road, CORNER, Singapore Field n. 30725, Jan. 1936, *p* (S); Tanah merah road, RIDLEY s.n., Jan. 1890, *p* (S); between Batu Pahat and Bandar Maharam, not uncommon along ditches, BURKILL and HANIFF, Singapore Field n. 16369, Oct. 1924 (S); Singapore, HULLETT 261, Dec. 1885, *p* (BD, S); MAYER, Schlesisch bot. Tauschverein 122, July 1895 (BD); RIDLEY s.n., *p* (S); Kranji, RIDLEY 14184, *p* (S); Jurong, RIDLEY 2687, Jan. 1890 (S); Bukit Tunah road, RIDLEY and HULLETT s.n. (S).

SUMATRA, without precise locality, KORTIALS 273, *b*, type of *f. barbata* (L); East Coast, JOCHIMS 3166, Dec. 1922 (B); E. of Locboek pakam, moist soil, c. 20 m, not common, LÖRZING 3299, Oct. 1914, *p* (B, L); near Serdang, c. 8 m,

<sup>1)</sup> *p*: *f. pubescens*; *b*: *f. barbata*.

Fig.2, A—I: *Merremia umbellata* (L.) MERRILL var. *orientalis* HALL. f., leaves; A: SOEGANDIREJA 180 (B); B—C: KORTIALS 126 (L); D—E: KOORDENS 28093  $\beta$  (B); F: WALLICH 1343 (L); G: BACKER 8774 (B); H: BACKER 17583 (B); I: BACKER 8460 (B); J—N: *Merremia tridentata* (L.) HALL. f. ssp. *genuina* (HALL. f.) VAN OOSTSTR., leaves; J: BÜNNEMEYER 1468 (B); K: TEYSMANN 3392 H.B. (B); L: TEYSMANN s.n. (L, 901, 163. 357); M: THOMSON s.n. (L, 901, 163. 352); N: HOLITUM, Singapore Field n. 15249 (B); O: *Merremia tridentata* (L.) HALL. f. ssp. *hastata* (DESR.) VAN OOSTSTR., leaf, BÜNNEMEYER 1927 (B); P—W: *Merremia hirta* (L.) MERRILL, leaves and branch; P: REINWARDT 150 (L); Q: KORTIALS 225 (L); R: without collector's name (L, 902, 35.162); S: BAKHUIZEN VAN DEN BRINK 5484 (L); T: RACHMAT 79 (L); U: two leaves of MERRILL 762 (U); V: WEINLAND 349 (L); W: branch of BAKHUIZEN VAN DEN BRINK 6366 (U); X—Z: *M. hirta* (L.) MERRILL var. *retusa* VAN OOSTSTR.; X: type, MERRILL 3615 (L); Y—Z: leaves of MERRILL, Spec. Blanc. 679 (B, L).

LÖRZING 3386, Nov. 1914 (B); Asahan, Boenoet, YATES 1881, Nov. 1925, *p* (S); West Coast, Pariaman, TEYSMANN† s.n. (B); Padang, KOETILALS 271, *b*, (L); id., without collector's name 226, March 1870, *b* (B); Djambi, Pahoe, 30 m, POSTHUMUS 1072, Oct. 1925, *p* (B, L, S, U).

JAVA, a specimen presumably from Java, *type of Evolvulus hedcraceus* BURM.f. (herb. BURMAN in herb. Genève). Without precise locality, without collector's name, 178, *b* (L); id., KOETILALS 120, *b* (L); Batavia, Tandjong Priok, 5 m s.m., BAKHUIZEN VAN DEN BRINK fil. 1442, July 1922, *p* (B); Mr. Cornelis, 20 m, BACKER 33561, July 1903 (B); Salemba, 15 m, BACKER 33560, Apr. 1903 (B); Weltevreden, 10 m, BACKER 33559, June 1902 (B); Pal Merah, S.W. of Weltevreden, 20 m, BACKER 33562, May 1903, *p* (B); Pantjoran Baroe near Tjikoja, ZOLLINGER 701, Nov. 1842, *type of Ipomoea subtriflora* ZOLL. et MOR., *p* (BD, K, L); Buitenzorg, Buitenzorg, 250 m, BAKHUIZEN VAN DEN BRINK Jr. 443, June 1920 (B); id., BAKHUIZEN VAN DEN BRINK 3835, June 1920 (L); id., BAKHUIZEN VAN DEN BRINK 6798, May 1927 (B); id., 245 m, BACKER 21372, July 1916 (B); cultivated in the Botanic Garden, TEYSMANN s.n., *p*, *type of f. pubescens* (L); id., HALLIER s.n., March 1893, *p* (L); XV. K. B. IX. 2, from Australia (B); XV. K. B. XI. 11, from Madoera (B); XV. K. B. XIII. 2 (B); XV. K. B. XIII. 10, *p* (B); XV. K. B. XIII. 12 (B); Priangan, PLOEM s.n. (L); Banjoemas, HORSFIELD (K (*p*); L, U); Soerabaja, Grisee, DONGELO 735, July 1922 (Pa); Malang, Djatiroto, 25 m, BACKER 8128, May 1913 (B). A specimen mentioned by ZOLLINGER under *Ipomoea chrysoides* (n. 2881) and collected in Besocki, near Gambiran, belongs to *Merremia hirta* (L.) MERRILL.

BORNEO, W. division, Poeloe Madjang, TEYSMANN 8293 (B); S. and E. division, Bandjermasin, MOTLEY 233 (K); Sarawak, Baram district, Baram, HOSE 290, Nov. 1894 (K); British North Borneo, AGAMA 465, Sept.-Dec. 1917, *p* (B); Sandakan, Myburgh Prov., in burned-over areas, near roads, ELMER 20329, Oct.-Dec. 1921 (B, BD, K, L, S, U).

CELEBES, Celebes and Dependencies, Pangkadjene, Tjampeang, TEYSMANN 12251, *p* (B, L).

TIMOR, without collector's name, 194, named *Lepistemon muricatum* SPAN. (L).

MOLUCCAS, Ternate, c. 20 m, BEGUIN 1610, May 1921, *p* (B, L); Batjan, BOERLAGE 567, Aug. 1900, *p* (B).

NEW GUINEA, Dutch New Guinea, Naumoni, Omeri, 150 m, MOSZKOWSKI 369, Oct. 1910, *p* (BD); Territory of New Guinea, SCHLECHTER 17548, Apr. 1908 (BD); Papua, Fly River, d'ALBERTIS (according to VON MUELLER, 1890); Fly River, Oroville Camp, 30 miles above d'Albertis Junction, massed on low rain-forest second growths, BRASS 7443, Aug. 1936, *b* (L).

PHILIPPINE ISLANDS, according to MERRILL, in thickets and in open grasslands at low altitudes. Luzon: Union, Pampanga, Rizal, Laguna; Masbate; Mindanao; Zamboanga. Without precise locality, CUMING 618 (BD); Luzon, CUMING 617 (BD, K); Pangasinan Prov., RAMOS, Bur. of Sc. 4835, Dec. 1907, *p* (S); id., Alaminos, MCGREGOR, Bur. of Sc. 41406, Dec. 1922 (B, BD, L); Rizal Prov., RAMOS, Bur. of Sc. 24088, Dec. 1915 (L); id., Manila, MERRILL 3419, Oct.-Nov. 1903 (BD, K); Masbate, MERRILL 3398, Nov. 1903, *p* (BD, K, L); Cebu, RAMOS, Bur. of Sc. 11041, March 1912 (L).

Distribution: Tropical Africa, Mascarene Islands; tropical



Asia from the Himalaya southwards to Ceylon and eastwards to Burma, China, the Malay Peninsula and Archipelago; N. Australia (Queensland).

Vernacular names: ramijo (Djambi, POSTHUMUS); aroj djo-tong gede (Sund., KOORDERS); tatapajan (Sund., Batavia, HALLIER); lawatan (E. Java, KOORDERS); rabassa (Java, BURMAN); kĕlĕmbiet (Borneo, W. division, Poeloc Madjang, TEYSMANN).

Remarks. On account of the pubescence of the seeds one can distinguish two forms:

1. a form with the seeds shortly pubescent or nearly glabrous over the whole surface or with only some slightly longer reddish brown hairs at the hilum and at the margins:

f. **pubescens** n.f. (Fig. 1, m), seminibus pubescentibus vel subglabris, hilo et interdum marginibus pilis nonnullis sublongioribus praeditis.

Type: TEYSMANN s.n., a specimen cultivated in the Botanic Garden at Buitenzorg (L).

2. a form with the seeds shortly pubescent, the hilum and the margins with long hairs, sometimes the long hairs also on the sides.

f. **barbata** n.f. (Fig. 1, n), seminibus pubescentibus, hilo et marginibus barbatis.

Type: KOERTHALS 273, Sumatra (L).

As far as the specimens mentioned under the species are in possession of ripe seeds, they are marked *p* or *b*, respectively indicating f. *pubescens* and f. *barbata*. As the type specimen of BURMAN in Genève has no ripe seeds, it is impossible to decide to which of these two forms it belongs.

3. **Merremia hirta** (L.) MERRILL in Philipp. Journ. Sc. VII (1912) Bot. p. 244; id., Spec. Blanc. in Philipp. Bur. of Sc. Publ. 12 (1918) p. 324 (see var. *retusa*); id. in Journ. Roy. As. Soc. Str. Br. Spec. Numb. (1921) p. 508; id., Enum. Philipp. Fl. Pl. III (1923) p. 361; id. in Philipp. Journ. Sc. LIX (1936) p. 452, pl. 1<sup>1)</sup> — *Convolvulus reptans* L., Spec. Plant. ed. 1 (1753) p. 158, excl. syn. Rheed.; HALL. f. in Meded. Rijksherb. 1 (1910) p. 21; id., ed. 2 (1923) p. 20; MERRILL in Philipp. Journ. Sc. LIX (1936) p. 451—452, pl. 1 — *C. hirtus* L., Spec. Plant. ed. 1 (1753) p. 159; HALL. f. in Meded. Rijksherb. 1 (1910) p. 21; id., ed. 2 (1923) p. 20 — *C. caespitosus* ROXB., Fl. Ind. II (1824) p. 70 (not seen); WALL., Cat. (1828) n. 1357 (*C. caespitosus*); ROXB., Fl. Ind. I (1832) p. 483 (*C. caespitosus*) — *Ipomoea linifolia* BL., Bijdr.

<sup>1)</sup> With important critical notes on the identity of *Convolvulus reptans* L.

(1825) p. 721; CHOISY in Mém. Soc. Phys. Genève VI (1833) p. 474; id. in DC., Prodr. IX (1845) p. 369; MIQ., Fl. Ned. Ind. II (1857) p. 604; id., Suppl. (1860) p. 235, 561; BENTH., Fl. Austr. IV (1869) p. 423; CLARKE in HOOK., Fl. Brit. Ind. IV (1883) p. 205; WARB. in ENGL., Bot. Jahrb. XIII (1891) p. 412; SCHUM.-LAUTERB., Fl. Deutsch. Schutzgeb. (1901) p. 517; MANSON BAILEY, Queensl. Fl. IV (1901) p. 1064; id., Compreh. Cat. Queensl. Pl. (1909) p. 349; GAGNEP. et COURCH. in LEC., Fl. Indo-Chine IV (1915) p. 262 — *Convolvulus Benthamii* WALL., Cat. (1828) n. 1393 — *Ipomoea philippinensis* CHOISY in Mém. Soc. Phys. Genève VI (1833) p. 475; id. in DC., Prodr. IX (1845) p. 367; MIQ., Fl. Ned. Ind. II (1857) p. 611; F.-VHL., Novis App. (1880) p. 141 (not seen) — *Skinneria caespitosa* (ROXB.) CHOISY in Mém. Soc. Phys. Genève VI (1833) p. 487, t. 6; id. in DC., Prodr. IX (1845) p. 435; ZOLL., Syst. Verz. 2. Heft (1854) p. 130 (*S. caespitosa*); MIQ., Fl. Ned. Ind. II (1857) p. 621 — *Convolvulus pratensis* BUCH.-HAM. ex CHOISY in Mém. Soc. Phys. Genève VI (1833) p. 487, in syn. — *C. linifolius* (BL.) DIETR., Syn. Pl. I (1839) p. 675, not of L., WALL. — *Hewittia caespitosa* (ROXB.) STEUD., Nom. ed. 2, I (1840) p. 757 — *Convolvulus hybridus* ZOLL. et MOR. in Nat. en Geneesk. Arch. Nederl. Ind. II (1845) p. 6; ZOLL. in Flora XXX (1847) p. 597 — *Ipomoea setulosa* ZOLL. et MOR. in MOR., Syst. Verz. (1846) p. 51 — *I. caespitosa* (ROXB.) O.K., Rev. gen. II (1891) p. 443 — *Merremia caespitosa* (ROXB.) HALL. f. in ENGL., Bot. Jahrb. XVI (1893) p. 552; id. in Versl. 's Lands Pl.t. 1895 (1896) p. 132; id. in Bull. Herb. Boiss. V (1897) p. 382; BOERL., Handl. Fl. Ned. Ind. II (1899) p. 510; PRAIN in Journ. As. Soc. Bengal LXXIV (1906) p. 304; HALL. f. in Meded. Rijksherb. 1 (1910) p. 21; id., ed. 2 (1923) p. 20; KOORDERS, Exk. fl. Java III (1912) p. 112; HALL. f. in ENGL., Bot. Jahrb. XLIX (1913) p. 378; KOORD.-SCHUM., Syst. Verz. (1910—13) Conv. p. 2; BOLD., Zakfl. Java (1916) n. 837; RIDLEY, Fl. Malay Penins. II (1923) p. 458; BACKER, Onkruidfl. Jav. Suikerrietgr. (1931) p. 518 — *Hewittia linifolia* Ind. Kew. (1895) p. 600, under *Convolvulus caespitosus* ROXB. Fig. 1, k; fig. 2, P—W.

An annual or biennial herb (CLARKE, PRAIN) with prostrate or twining, slender, filiform, terete, sparsely patentely hirsute or glabrous stems, 20—50 cm long (BACKER), the prostrate ones rooting at the nodes and sometimes at the internodes. Leaves rather remote, shortly petioled; petiole (1—)3—8(—20) mm long, hairy above; leafblade very variable in form, linear, linear-oblong, oblong-lanceolate or oblong to ovate-oblong or ovate, occasionally orbicular to subquadrate, the narrow leaves 3—

6 cm long and 0.3—0.9 cm broad, 5—12 times as long as broad, the broad ones 1.5—4.5 cm long and 0.8—2.5 cm broad, 1—5 times as long as broad, in some specimens strikingly resembling those of *Convolvulus arvensis*, the apex obtuse to slightly emarginate and mucronulate, the base rounded, truncate, more or less cordate or hastate with small or large, obtuse, spreading or parallel auricles; the surfaces glabrous or with a few hairs beneath and along the margins, sometimes also above, in some specimens the indument is much more developed, especially on the stems, the petioles, the leafblades and the basal part of the peduncles. Inflorescences axillary, 1—few-flowered, mostly to 4-flowered, in some specimens to 8; the ramifications monochoasial (racemelike and unilateral), or the first ramification dichasial and the following ones monochoasial (racemelike and unilateral); peduncles glabrous or with some hairs near the base, filiform, terete, variable in length, 1—7.5 cm long; bracts small, 1—2 mm long, ovate, obtuse, glabrous, persistent; pedicels glabrous, 3—5 mm long. Flower-buds oblong to elliptic, obtuse. Sepals glabrous, unequal, the 2 outer shorter, elliptic, obtuse, 3—4 mm long, the 3 inner longer, oblong or elliptic oblong, 4.5—6 mm long, the margins when dry often inflexed above; sepals slightly enlarged in fruit, to 6 or 7 mm long, with more or less prominent nerves. Corolla pale-yellow or whitish, broadly funnel-shaped, glabrous, 1.5—2 cm long, the midpetaline bands in dried state with distinct dark nerves. Filaments dilated and hairy at the base, 5.5 mm long, the anthers spirally twisted. Ovary glabrous, conical, 2-celled; style filiform, glabrous, 8 mm long. Capsule broad-ovoid to globular, with a thin papery wall, smooth, glabrous, 1-celled, crowned by the base of the style, about 6 mm long, 4-valved, the valves nerved; seeds 4 or less, dark-brown or black, glabrous or sparsely floccose at the margins and at the hilum.

MALAY PENINSULA, according to PRAIN, 1906 and RIDLEY, 1923 in Perlis, prov. Wellesley, Perak, Pahang, Malacca and Singapore, "common in grass". Perlis, Gua Nangka, HENDERSON, Singapore Field n. 23065, Nov. 1929 (S); Prov. Wellesley, Muda River, Dusun Gajah, BURKILL, Singapore Field n. 3082, Jan. 1918 (S); Permatang Bertam, RIDLEY s.n., Dec. 1895 (S); Penang, cult. in the Botanic Gardens, MD NUR s.n., May 1919 (S); Perak, Ipoh, BURKILL, Singapore Field n. 2787, Nov. 1917 (S); Tringganu, ROSTADOS s.n., Febr. 1890 (S); Pahang, Katapang, Pekan, RIDLEY s.n., May 1890 (S); Telok Sisik, Kuantan, BURKILL and HANIFF, Singapore Field n. 17324, Dec. 1924 (S); Selangor, Salak, South road, coll. 1, Jan. 1921 (K); Singapore, HULLETT 112, March 1884 (S); HULLETT 263, Nov. 1885 (S); RIDLEY s.n. (S, fasciation); CANTLEY s.n. (S, fasciation); Kranji, GOODENOUGH s.n., Dec. 1889 (S); Chan Chu Kang, RIDLEY 2686, Nov. 1889 (S).

SUMATRA, Tapanoeli, Middle Habinsaran, between Sibosor and Parsoboeran, waste places, rare, c. 1100 m, LÖRZING 7761, Nov. 1920 (B); West Coast, Pa-

danglawas, HORNER s.n. (L); Fort van der Capellen, MATTHEW s.n., Jan. 1913 (K); Bangkaja, AMAND s.n. (K, L, U).

JAVA, according to BACKER in West and Middle (but also in East, *the author*) Java, in the lower parts, in damp grasslands. Without precise locality, HORSFIELD Conv. 1 (K); id., JUNGHUHN s.n. (L); id., REINWARDT 150 (L); id., ZIPPELIUS 197 (L); id., Tjilendeh, RAAP 344, June 1894 (L); id., Tjikaret Oedik, RAAP 445, June 1894 (L); Bantam, Bodjangmanik, waysides, common, KOORDERS 41514 $\beta$ , June 1912 (B); Rangkasbitong, common in grass, 50 m, BACKER 1029, June 1911 (B); Sadjira, wayside, common, c. 150 m, BACKER 2067, June 1911 (B); Batavia, Weltevreden, BACKER 35451, June 1903 (B); id., BACKER 35452 (B); Bidaratjina, EDELING s.n. (B); Kandangapi, KORTIALS 225 (L); Poerwakarta, grassy places, waysides, common, 60—150 m, BACKER 13766, June 1914 (B); Buitenzorg, Buitenzorg, grassland, 240 m, BAKHUIZEN VAN DEN BRINK fil. 1505, July 1922 (B, L); id., rice fields, HALLIER 207a, Apr. 1893 (B); id., cultivated in the Botanic Garden, HALLIER C. 161a, May 1895 (L); behind Tjiwaringin, HALLIER 207c, Apr. 1893 (B); near Waroeng mangga, HALLIER 207b, May 1893 (B); Bodjong Ejet, rather common in grassland and dry rice fields, 200 m, BAKHUIZEN VAN DEN BRINK 6366, June 1924 (B, L, U); Depok, c. 90 m, BAKHUIZEN VAN DEN BRINK 5484, May 1922 (B, L); Sockaradja, wayside, common, 250 m, BAKHUIZEN VAN DEN BRINK 3800, July 1920 (B); Koeripan, dike of rice field, VAN STEENIS 4490, July 1930 (B); near Tjibaroesa, grassy places, dikes of rice fields, waysides, frequent, c. 100 m, VAN STEENIS 5285, May 1933 (B); Tjibodas, Tjinaroeca, RAAP 832, July 1894 (L); Palaboehan-ratoe, BOERLAGE s.n., July 1888 (L); Tjidaoen near Palaboehan, beach, KOORDERS 34665 $\beta$ , Apr. 1899 (B); Babakan, LEHMANN s.n. (BD); Chérignon, Alaëta, 15 km NNW. of Kadipaten, VAN HAREVELD s.n., July 1923 (Pa); Semarang, Kedoengdjati, KOORDERS 28462 $\alpha$ , June 1897 (B, L); Soerabaja, Wonokromo, DORGELO 762bis, July 1924 (Pa); Besoecki, Djember, ULTÉE 3 (B); Moemboel, ZOLLINGER 1450, *type of Convolvulus hybridus* ZOLL. et MOR. and of *Ipomoea setulosa* ZOLL. et MOR. (BD) (according to ZOLLINGER also collected near Tjoerock (Tjoeroeg), Batavia); near Gambiran, ZOLLINGER 2881 (BD); Madoera, Pamekasan, Tamboeng, Adjunct advisory agricultural expert of Pamekasan 20, June 1934 (B); Kangean-islands, Kangean, S.E. Ardjasa, moist grasslands, frequent, 50 m, BACKER 30033, May 1919 (B).

BORNEO, S. and E. division, Bandjermasin, MOTLEY 892 (K); Hayoep, June 1908, WINKLER 2275 (BD); British North Borneo, Labuan, HULLETT 387, Nov. 1884 (K); id., MERRILL c, Nov. 1902 (S); according to MERRILL 1921, collected in Sarawak: Native collector, Bur. of Sc. 1975.

CELEBES, Bili-bili, RACHIMAT 79, exp. VAN VUUREN, June 1913 (B, L); Lasao, along field, 100 m, KJELLBERG 1174, Apr. 1929 (B); Celebes and Dependencies, Bonto Parang, wayside, 50 m, BÜNNEMEYER 10692, March 1921 (B).

MOLUCCAS, Amboina, REINWARDT 51 (L); id., without collector's name, 294, named *Ipomoea linifolia* BL. in BLUME's handwriting (L); id., id. 1392 (L); id., id. 34/d (L); Soja di bawa, TREUB 562 (B, mixed with *Merremia tridentata* (L.) HALL.f. ssp. *hastata* (DESR.) VAN OOSTSTR.); Karang Pandjang, RANT 231, June 1929 (B, mixed with *Merremia tridentata* (L.) HALL.f. ssp. *hastata* (DESR.) VAN OOSTSTR.); Waai, beach, RANT 766, Nov. 1931 (B); Ceram, W. Ceram, W. of Piroe, along fields, RUTTEN 1692, Sept. 1918 (B, L); Boano island, KORNASSI 1306, May 1918 (B).

NEW GUINEA, Territory of New Guinea, Finschhafen, WARBURG

(according to WARBURG, 1891); Matatakum, grasslands, WEINLAND 349, Oct. 1890 (B, BD, L, S); near Constantinhafen, SCHLECHTER 14276, March 1902 (BD); Flachsee, 30—40 m, LEDERMANN 7004, Apr. 1912 (BD); Papua, Kanosia, in open savannah land, c. 50 ft, CARR 11756, Apr. 1935 (BD, L); Lake Daviumbu, Middle Fly River, savannahs, abundant in grass on shores of swamps, BRASS 7543, Aug. 1936 (L); id., occasional on wet grass plains and low savannahs, BRASS 7836, Sept. 1936 (L).

BISMARCK ARCHIPELAGO, New Ireland, Namatanai, Nukonuko, along field, PEEKEL 364, March 1910 (BD).

PHILIPPINE ISLANDS, according to MERRILL in open grasslands, at low altitudes; Luzon: Cagayan, Lepanto, Pangasinan, Tarlac, Bulacan, Rizal; Culiion; Guimaras; Cebu; Mindanao: Lanao, Davao. Luzon, Prov. of Cagayan, RAMOS, Bur. of Sc. 14578, Febr. 1912 (L); Zambales Prov., Anuling, RAMOS and EDAÑO, Bur. of Sc. 44610, Nov.-Dec. 1924 (B, K); Rizal Prov., Manila, GAUDICHAUD 187 (? 181?) and 188, Nov. 1836 (P, mixed with *Merremia gemella* (BURM.f.) HALL.f.); id., LOHER 4161 (K); id., Novaliches, in grass, LOHER 4159, Nov. 1890 (K); id., MERRILL, Bur. of Sc. 762, Nov. 1910 (U); Culiion, open damp soil, MERRILL 475, Dec. 1902 (BD); Mindanao, Distr. of Davao, Davao, COPELAND 597, March 1904 (K).

Distribution: India to Southern China, Malaysia and tropical Australia.

Vernacular name: rebbha teng-ketteng (Madoera).

var. *retusa* VAN OOSTSTR., nov. var. Fig. 2, X—Z.

Differt sepalis interioribus 3 latioribus late ellipticis vel subquadratis, apice truncatis vel retusis mucronulatis, sepalis exterioribus ellipticis obtusis vel acutiusculis mucronulatis. Folia oblonga, 0.8—2.5 cm longa, apice obtusa vel subretusa mucronulata, basi hastata, lobis integris vel 1—2-dentatis. Pedunculi breves, ad 1 cm longi, 1- vel interdum 2—3-flori.

PHILIPPINE ISLANDS, Luzon, Prov. Benguet, Cervantes, LOHER 4160 (K); Prov. Zambales, LOHER 6687, Febr. 1906 (BD, K); Prov. Tarlac, Concepcion, MERRILL 3615, Nov. 1903 (BD, K; L, *type*); Prov. Bulacan, Angat, MERRILL, Spec. Blanc. 679, Dec. 1914 (B, BD, K, L); Prov. Rizal, Antipolo, VIDAL 3347, March 1886 (K); Manila, VIDAL 3346, March 1886 (K).

Distribution: Philippine Islands.

Remarks. The specimen MERRILL, Spec. Blanc. 679 was distributed by that author as an illustrative specimen of BLANCO's *Ipomoea hepaticifolia* (BLANCO, Fl. Filip. ed. 2 (1845) p. 72 (not seen); id., ed. 3 (1877) p. 134, non L.). See MERRILL, Spec. Blanc. (1918) p. 324. On account of the short, incomplete description of BLANCO it is, however, impossible to verify MERRILL's opinion.

4. *Merremia dichotoma* VAN OOSTSTR., nov. spec. Fig. 1, b—c.

Frutex scandens, ramis gracilibus ad 2 mm diam., teretibus, leviter striatis, griseo-brunneis, minute verrucosis, parce hirsutis, glabrescentibus vel glabris; foliis petiolatis, petiolo glabro vel apicem versus pilis non-

nullis praedito, 1.5—2.5 cm longo, ovatis, 4—7 cm longis, 2.5—3.5 cm latis, glabris, integris, apicem versus gradatim attenuatis, apice obtusis mucronulatis, basi cordatis, auriculis rotundatis; nervis lateralibus utrinque 8—10; inflorescentiis axillaribus, glabris, 6—15 cm longis, pedunculis teretibus laevibus, 4—7 cm longis, apice plerumque simpliciter, interdum duplo raro triplo dichasialiter ramosis, ramis ultimis monochasialibus, ramis omnibus bracteas persistentes oblongas vel ovatas, concavas, 2—4 mm longas, gerentibus, pedicellis 5—6, demum ad 8—9 mm longis; alabastris obtusiusculis, sepalis glabris, inaequilongis, exterioribus 2 brevioribus, 4 mm longis, oblongis vel oblongo-ellipticis, obtusis, minutissime mucronatis, interioribus 6 mm longis, late ovatis vel orbicularibus, obtusis vel subretusis; corolla alba, late infundibuliforme, fasciis 5 distincte 5-nervosis praedita, glabra, circ. 18 mm longa, intus sub basi omnium filamentorum duas series pilorum gerente; filamentis circ. 2.5 mm supra basin corollae insertis, circ. 10 mm longis, parte inferiore valde dilatata, 2 mm longa, pilosa, apice elongata, incurvata, squamiforme; ovario globoso, glabro, stylo filiforme, 13 mm longo, stigmatibus globosis; capsula subglobosa, mucronata, circ. 7 mm alta, 4-valvata, valvis reticulato-rugosis, 2-loculata, seminibus 2 in loculo, circ. 3.5 mm longis, nigris, opacis, parce pubescentibus, marginibus villosis.

TIMOR, South Middle Timor, Kolbano, S. coast, not frequent, WALSH 375, April 1929 (B, *type*).

Distribution: Timor.

Vernacular name: knâtan.

5. *Merremia emarginata* (BURM. f.) HALL. f. in ENGL., Bot. Jahrb. XVI (1893) p. 552; id. in ENGL., Bot. Jahrb. XVIII (1894) p. 118; id. in Versl. 's Lands Pl.t. 1895 (1896) p. 132; BOERL., Handl. Fl. Ned. Ind. II (1899) p. 510; COOKE, Fl. Bombay II (1905) p. 236; BAKER and RENDLE in THIS-DYER, Fl. Trop. Afr. IV, 2 (1905) p. 113; DUTHIE, Fl. Upper Ganget. Pl. II (1911) p. 109; KOORDERS, Exk. fl. Java III (1912) p. 113; BOLD., Zakfl. Java (1916) n. 835; MERRILL, Spec. Blanc. in Philipp. Bur. of Sc. Publ. 12 (1918) p. 324; id. in Philipp. Journ. Sc. XIX (1921) p. 374; GAMBLE, Fl. Pres. Madras V (1923) p. 928; MERRILL, Enum. Philipp. Fl. Pl. III (1923) p. 360; HEYNE, Nutt. Pl. ed. 2 (1927) p. 1299; BACKER, Onkruidfl. Jav. Suikerrietgr. (1931) p. 518 — *Evolvulus emarginatus* BURM. f., Fl. Ind. (1768) p. 77, t. 30, fig. 1 — *Convolvulus reniformis* ROXB., Fl. Ind. II (1824) p. 67 (not seen); WALL., Cat. (1828) n. 1398; ROXB., Fl. Ind. I (1832) p. 481; BLANCO, Fl. Filip. (1837) p. 91; id., ed. 2 (1845) p. 67 (not seen); id., ed. 3, I (1877) p. 126 — *Ipomoea reniformis* (ROXB.) CHOISY

in Mém. Soc. Phys. Genève VI (1833) p. 446; id. in DC., Prodr. IX (1845) p. 351 (excl. syn. L.); ZOLL., Syst. Verz., 2. Heft (1854) p. 128; CLARKE in HOOK., Fl. Brit. Ind. IV (1883) p. 206; ROLFE in Journ. Bot. XXIII (1885) p. 214; FORBES, Wander., Germ. ed. II (1886) p. 222; VIDAL y SOLER, Rev. Plant. Vasc. Philipp. (1886) p. 196; WATT, Dict. Econ. Prod. India IV (1890) p. 491; PRAIN in Journ. As. Soc. Bengal LXIII (1894) p. 106; TRIMEN, Handb. Fl. Ceyl. III (1895) p. 218 — *Convolvulus excisus* ZIPP. in Linnæa XV (1841) p. 338, in syn. — *Ipomoea cymbalaria* FENZL. in Flora XXVII (1844) p. 312, nomen — *Lepistemon reniformis* (ROXB.) HASSK., Pl. Jav. Rar. (1848) p. 524; MIQ., Fl. Ned. Ind. II (1857) p. 629; F.-VILL., Novis App. (1880) p. 142 (not seen). BOERLAGE gives the name *Lepostemus reniformis* as a synonym under *Merremia emarginata* — *Evolvulus Glechoma* WELW., Apont. Phytogeogr. Angola (1859) p. 589 — *Ipomoea emarginata* (BURM. f.) O. K., Rev. Gen. (1891) p. 444.

A perennial herb, the stems prostrate and rooting at the nodes, terete or subangular, branched, sparsely hairy and glabrescent, the older parts sometimes warty, 30–75 cm long (BACKER). Leaves kidney-shaped to broad-ovate, coarsely crenate or entire, the apex obtuse to broadly rounded or slightly emarginate, the base cordate with broadly rounded sinus, the auricles rounded; surfaces glabrous or sparsely appressed pilose; length 0.5–2.5 (–3.5) cm, width 0.6–2.5 (–3.5) cm; petiole about as long as the blade or shorter, terete, sulcate above, short-hairy or minutely verrucose, 0.2–2 (–3.75) cm long. Flowers axillary, solitary or in 2–3-flowered cymose clusters; peduncle very short or nearly absent; pedicels short, 2–4 mm; bracts small, ovate to linear, acute, hairy. Flower-buds globular, obtuse. Sepals obovate to orbicular or subquadrate, the outer ones obtuse with cucullate and distinctly mucronate top, the inner ones deeply emarginate, all long ciliate at the margin and more or less hairy on the back, the outer ones 2.5–3 mm, the inner ones 3–4 (–6) mm long. Corolla tubular-campanulate, glabrous, 5–9 mm long, slightly 5-lobed at the margin, yellow with paler base and with 5 distinct, 5-nerved midpetaline bands, these bands suffused purple outside; corolla hairy inside at the base of the filaments. Ovary conical, glabrous; style filiform, glabrous, c. 4 mm; filaments hairy at their base, c. 4.5 mm long, inserted near the base of the corolla; disk low, yellow. Capsule black (HALLIER), subglobose, 5–6 mm in diam., longitudinally sulcate, glabrous, crowned by the thickened, smooth base of the style; the capsule at its base enclosed by the sepals; seeds 4 or less, greyish-brown, glabrous, dotted, c. 2.5 mm long.

JAVA, from W. to E. Java, in the lower parts with rather strong to very strong east monsoon, on rather heavy soil, on fields and grasslands, locally frequent. Without precise locality, TEYSMANN s.n. (B); id., ZOLLINGER s.n. (U); Batavia, Chinese churchyard, N. of Weltevreden, HALLIER s.n., Aug. 1896 (B); Batavia, VORDERMAN s.n. (B); Pegansaän, BACKER 34326, May 1903 (B); Weltevreden, Koningsplein, KOORDERS 32604  $\beta$ , July 1898 (B); Meester Cornelis, BACKER 34327, July 1903 (B); Poerwakarta, 75 m, BACKER 13876, June 1914 (B); Tjikoempaj, E. of Poerwakarta, c. 110 m, HARMSSEN 72, Dec. 1921 (B); Buitenzorg, cultivated in the Botanic Garden, XV. K. B. XII. 8 (B); Cheribon, forestry Indramajoe, along railroad, 20—30 m, VAN STEENIS 6752, March 1935 (B); Pekalongan, Tegal, 1 m s.m., sandy soil behind beach, BACKER 15258, Aug. 1914 (B); between Slawi and Bala-poelang, 50—100 m, BACKER 15384, Sept. 1914 (B); Banjoemas, Kawoeng anten near Maos, 25 m, railroad, BACKER 4642, Sept. 1912 (B); Magelang, Keboemen, 25 m, BRINKMAN 353 (B); Semarang, Sugar factory Rendeng, without collector's name and number (Pa); Djapara-Rembang, Ngandang, Sedan, 150 m, KOORDERS 34860  $\beta$ , June 1899 (B); Madioen, Kendal, dry sunny wayside, 5 m, BACKER 16294, Sept. 1914 (B); Soerabaja, Soerabaja, ZIPPELIUS 195 (L); Madjakerta, VAN HARREVELD s.n., Febr. 1915 (B); Gresik, VAN SLOOTEN 2042, Sept. 1928 (B); Malang, Malang, waysides, ZOLLINGER 2483, Nov. 1844 (B, BD); G. Semongkrong near Pasoeroean, dry fields, 20—80 m, BACKER 24237, June 1918 (B); Bangil, VAN STEENIS 7216, June 1935 (B, mixed with *Merremia gemella* (BURM.f.) HALL.f.).

BORNEO, S. and E. division, Bandjermasin, KORTIALS 108 (L).

TIMOR, without precise locality, ZIPPELIUS 57/c, type of *Convolvulus excisus* ZIPP. (L, U); id., ZIPPELIUS? 196 (L); id., without collector's name (BD, L, P).

SOEMBAWA, E. Soembawa, Kapenta, wayside, 200 m, DE VOGD 2555, June 1936 (B).

PHILIPPINE ISLANDS. According to MERRILL, Spec. Blane. (1918) p. 324, the species has all the appearance of being an introduced one in the Philippines, as it occurs only in the settled areas. In dry open grasslands and waste places at low altitudes. Luzon, Prov. Pangasinan, Alaminos, CLEMENS 18171bis, Apr. 1928 (B, S); id., Anda Is., edge of rice field, CLEMENS 18172, Apr. 1928 (B); Prov. of Bataan, Limay, ROBINSON, Bur. of Sc. 9619, Dec. 1909 (BD, L); id., Lamac, MERRILL, Spec. Blane. 357, Nov. 1913 (B, BD, K, L, P); Rizal prov., Manila, GAUDICHAUD 180, Nov. 1836 (P); id., id., GAUDICHAUD s.n. (BD); Prov. Albay, CUMING 1030 (L).

Distribution: Tropical Africa, tropical Asia, Malaysia.

Vernacular names: emboen, pġgagan octan (Jav., HEYNE); paschaga-octan-kitsjil (Jav., BURMAN); bato-bato (Philipp., Tagalog language, BLANCO), kupit-kupit (Philipp., Ilóko language, MERRILL).

Use: According to WATT l.c. "the plant is described as deobstruent and diuretic (Sakharam Arjun)". DYMOCK remarks that the Hindus administer the juice in rat-bite, and drop it into the ear to cure sores in that organ. According to ROXBURGH and to WATT the plant is used as a pot-herb.

HEYNE l.c. writes: "Mrs. KLOPPENBURG recommends an infusion of the leaves in cases of "burning motions" and a decoction of the leaves with sugar as a cough-medicine."



**Remarks.** BACKER describes the stems, the leaves and the margins of the sepals as being often suffused purple. He also points out the resemblance of the vegetative parts with those of *Centella asiatica* URB. The species has been also confounded in the herbaria with *Dichondra repens* FORST.

## Section 2. *Streptandra* HALL. f.

HALL. f. in ENGL., Bot. Jahrb. XVIII (1894) p. 114.

Flower-buds ovoid or conical, mostly acute; midpetaline bands of the corolla in dried state often with 5 dark lines; flowers of moderate size or large.

6. *Merremia tridentata* (L.) HALL. f. in ENGL., Bot. Jahrb. XVI (1893) p. 552; id. in ENGL., Bot. Jahrb. XVIII (1894) p. 116; BOERL., Handl. Fl. Ned. Ind. II (1899) p. 510; COOKE, Fl. Bombay II (1905) p. 237; BAKER and RENDLE in THIS-DYER, Fl. Trop. Afr. IV, 2 (1905) p. 111; PRAIN in Journ. As. Soc. Bengal LXXIV (1906) p. 304; DUTHIE, Fl. Upper Ganget. Pl. II (1911) p. 108; GAMBLE, Fl. Pres. Madras V (1923) p. 928; RIDL., Fl. Malay Penins. II (1923) p. 458 — *Convolvulus tridentatus* L., Spec. Pl. (1753) p. 157; ROXB., Fl. Ind. II (1824) p. 56; WALL., Cat. (1828) n. 1347; ROXB., Fl. Ind. I (1832) p. 475 (*C. tridentatus* WILLD.) — *Evolvulus tridentatus* (L.) L., Spec. Pl. ed. 2 (1762) p. 392; BURM. f., Fl. Ind. (1768) p. 77, t. 16, fig. 3 — *Ipomoea tridentata* (L.) ROTH in ROEM., Arch. Bot. I, 2 (1798) p. 38; CHOISY in Mém. Soc. Phys. Genève VI (1833) p. 447; id. in DC., Prodr. IX (1845) p. 353; MIQ., Fl. Ned. Ind. II (1857) p. 603; id., Suppl. (1860) p. 235, 561; CLARKE in HOOK., Fl. Brit. Ind. IV (1883) p. 205; TRIMEN, Handb. Fl. Ceyl. III (1895) p. 218; GAGNEP. et COURCH. in LEC., Fl. Indo-Chine IV (1915) p. 265.

*M. tridentata* (L., 1753) HALL. f. and *M. hastata* (DESR., 1789) HALL. f. seem to be so closely related that I do not hesitate to unite them as subspecies under the name of the former. (See remarks under ssp. *hastata*).

ssp. *genuina* (HALL. f.) VAN OOSTSTR., nov. ssp. — *M. tridentata* (L.) HALL. f. var. *genuina* HALL. f. mss. inedit. Fig. 2, J—N.

A prostrate herb; the stems several from a stout perpendicular root, angular, glabrous, 10 to 80 cm long. Leaves small, glabrous, 4—20(—30) mm long, (0.5—)1.5—4(—6) mm broad, linear (in some specimens nearly filiform) or linear-oblong to oblanceolate, spatulate or subquadrate, the apex obtuse, truncate or emarginate and mucronulate

to tridentate (occasionally part of the leaves has the apex acute and mucronulate), the base not or slightly broadened, truncate to hastate, the auricles as far as present spreading or parallel with 1 tooth or with a few teeth, the leaf margin above the base entire or slightly crenate to dentate; petiole very short,  $\frac{1}{2}$ —2 mm or nearly absent. Flowers in 1—2(—3) flowered cymes; peduncles axillary, glabrous or pubescent near the base, 8—15(—20) mm long; pedicels glabrous, angular, thickened above in fruit, 4—8 mm long; bracts minute, oblong, mucronulate. Flower-buds narrow-conical, acute. Outer sepals mostly shorter than the inner ones, oblong, obtuse to emarginate, mucronulate, 3—4 mm long, inner ones lanceolate, attenuate-acuminate into a slender point, 4—6 mm long, occasionally the outer sepals are not so distinctly obtuse at apex but more acute, more rarely the outer as well as the inner sepals are obtuse and mucronulate (so in specimens from British India, not seen in Malaysian specimens). Corolla funnel-shaped, completely yellow, yellowish white or white or with a purple centre, glabrous, 10—12 mm high. Filaments inserted about 1.5 mm above the base of the corolla, slightly dilated at their base and there glabrous or with a few short hairs. Disk low. Ovary glabrous; style filiform. Capsule ovoid, 4—5 mm high, 4-valved, the wall papery, glabrous, straw-coloured; seeds 4 or less, glabrous, black, opaque, 2—2 $\frac{1}{4}$  mm high.

MALAY PENINSULA; according to RIDLEY in sea sand. Without precise locality, MAINGAY 1147 (K, L); id., MAINGAY 2951, Apr. 1867—68 (K); Penang, Telok Bahang, open sandy places, CURTIS s.n., Aug. 1884 (S); Batu Feringhi, CURTIS 952, June 1886 (K, S); Trengganu, Bukit Tok Beng, HOLTTUM, Singapore Field n. 15249, May 1925 (S); Malacca, GRIFFITH s.n. (K); Tanjong Kling, sandy places, RIDLEY 3181, June 1892 (S); mouth of Linggi River, sandy places near coast, JAGOR 220, May 1858 (BD); Johore, Batu Pahat, RIDLEY 11114 (S); Singapore, CANTLEY 2931 (S); Changi, RIDLEY s.n. (S).

SUMATRA, Riouw and Dependencies, Anambas Islands, Temaja, padang near Letong, sea level, creeping in sand, HENDERSON, Singapore Field n. 20326, Apr. 1928 (B, S); Riouw Archipelago, P. Oedjan, near P. Bintan, near beach, 2 m, BÜNNEMEYER 6448, June 1919 (B, L); Bangka and Dependencies, Bangka AMAND s.n. (K); id., TEYSMANN 3392 HB (B, L, U); id., Muntok, near coast, TEYSMANN s.n. (B, BD, K, L); id., sand near sea, 4 m, BÜNNEMEYER 1468 (B); id., Tandjong Kalian, beach, common, 2 m, BÜNNEMEYER 1562, Oct. 1917 (B, L); Soengei Slan, TEYSMANN s.n. (B, L).

JAVA, West Java, without precise locality, PLOEM s.n. (L); a specimen from Bangka, cultivated in the Botanic Garden, Buitenzorg, TEYSMANN s.n. (L).

CELEBES, Pasoei, wayside, 600 m, KJELLBERG 1643, June 1929 (B).

Distribution: Tropical Africa, Mascarene Islands; tropical Asia from Bengal and Central Provinces southwards to S. India and Ceylon, eastwards to the Malay Peninsula and the Malay Archipelago.

Vernacular name: kong kong pasir (Malay Peninsula, RIDLEY).

ssp. *hastata* (DESR.) VAN OOSTSTR., nov. ssp. — *Convolvulus hastatus* DESR. in LAMK., Encycl. III (1789) p. 542, non SIEB., THUNB., FORSK. — *C. simplex* PERS., Syn. I (1805) p. 178, non SPR. — *Ipomoea denticulata* R. BR., Prodr. Fl. Nov. Holl., ed. 1 (1810) p. 485, non CHOISY; Bot. Reg. IV (1818) t. 317 — *Convolvulus denticulatus* (R. BR.) SPRENG., Syst. I (1825) p. 603 — *C. linifolius* WALL., Cat. (1828) n. 1389 — *C. Blumei* DIETR., Syn. Pl. I (1839) p. 675 — *Ipomoea Blumei* (DIETR.) STEUD., Nom. ed. 2, I (1840) p. 815 — *Merremia hastata* (DESR.) HALL. f. in ENGL., Bot. Jahrb. XVI (1893) p. 552; id. in ENGL., Bot. Jahrb. XVIII (1894) p. 117; id. in Versl. 's Lands Pl.t. 1895 (1896) p. 126; id. in Bull. Herb. Boiss. V (1897) p. 381; id. in Meded. 's Lands Pl.t. XIX (1898) p. 544; BOERL., Handl. Fl. Ned. Ind. II (1899) p. 509; COOKE, Fl. Bombay II (1905) p. 238; MERRILL in Philipp. Journ. Sc. I (1906) Suppl. p. 120; PRIN in Journ. As. Soc. Bengal LXXIV (1906) p. 303; HALL. f. in VALETON, Pl. Pap. in Bull. Dep. Agric. Ind. Néerl. X (1907) p. 50; DUTHIE, Fl. Upper Ganget. Pl. II (1911) p. 108; KOORDERS, Exk. fl. Java III (1912) p. 114; KOORD.-SCHUM., Syst. Verz. (1910—13) Conv. p. 2; id. (1914) p. 109; BOLD., Zakfl. Java (1916) n. 833; MERRILL in Journ. Roy. As. Soc. Str. Br. Spec. Numb. (1921) p. 508; GAMBLE, Fl. Pres. Madras V (1923) p. 929; RIDLEY, Fl. Malay Penins. II (1923) p. 457; MERRILL, Enum. Philipp. Fl. Pl. III (1923) p. 361; FORBES in Journ. Bot. LXIII, Suppl. (1925) p. 71; BACKER, Onkruidfl. Jav. Suikerrietgr. (1931) p. 517 — *M. tridentata* (L.) HALL. f. var. *hastata* (DESR.) HALL. f. mss. inedit. Fig. 2, O.

Herb, usually twining, occasionally with prostrate stems. Stems one or several from a stout perpendicular root, slender, more or less angular to subulate, glabrous, 0.60 to 2.00 m long (BACKER). Leaves larger than in ssp. *genuina*, generally glabrous, 2.5—8(—10) cm long, 1.5—15(—20) mm broad, narrow-oblong, linear-oblong, linear or sometimes (especially the upper ones, or occasionally all) narrow-linear, more or less contracted above the base, gradually attenuate towards the distinctly mucronate, sharply acute, or obtuse or sometimes emarginate apex, the base with more or less stemclasping, obscurely to sharply dentate auricles, the leaf margin above the base entire or indistinctly undulate; petiole nearly absent or very short, 1—3 mm long. Flowers in 1—few-flowered cymes; peduncles axillary, thin, glabrous or mostly pubescent near the base, 1—8 cm long; pedicels as long as or longer

than the calyx, glabrous, angular, thickened above in fruit, 6 mm or longer, in fruit to 15 mm long; bracts minute, subulate. Flower-buds narrow-conical, acute, the tips of the sepals more or less curved outwards. Sepals equal in length or the exterior ones a little shorter (5—) 6—7(—10) mm long, glabrous, all lanceolate to ovate-lanceolate, attenuate-acuminate into a sharp, slender point, the margin of the sepals narrowly scarious, undulate. Corolla funnel-shaped, completely pale yellow or white or with a purple to chocolate brown centre, glabrous, 12—20 mm high. Filaments inserted about 3 mm above the base of the corolla, slightly dilated at their base and there with a few short hairs. Disk low. Ovary glabrous, style filiform. Capsule globose to ovoid, 4-valved, the wall papery, glabrous; the dissepiment often persistent after dehiscence of the fruit; seeds 4 or less, black or dark-grey, opaque, glabrous, 2.5—3 mm high.

MALAY PENINSULA; according to RIDLEY very common in grassy spots, climbing over bushes. Without precise locality, MAINGAY 1146 and 3067, Dec. 1867 (K); Perlis, Gua Nangka, HENDERSON, Singapore Field n. 23070, Nov. 1929 (S); Kedah, Kampong Naka, 100 ft, HOLTTUM, Singapore Field n. 19812, Sept. 1933 (S); Kelantan, Kuala Lebir, common, GIMLETTE s.n., July 1904 (S); Penang, coast, CURTIS 1068, Oct. 1886 (S); Ayer Etam, CURTIS s.n., Nov. 1898 (S); road D.B. (Dayang Bunting) Pulau, CURTIS 1068, March 1892 (S); Perak, SOORTECHINI 138 (BD); CANTLEY's collector (S); WRAY Jr. 1751, Apr. 1888 (S); Ipoh, BURKILL, Singapore Field n. 2786, Nov. 1917 (S); Kuala Wok, WRAY Jr. 859 (S); rocks in Kuala Temengor, RIDLEY 14259, July 1904 (S); Taiping, HENDERSON, Singapore Field n. 10364, Jan. 1923 (S); Taiping, Maxwell's hill, HENDERSON, Singapore Field n. 10083, Jan. 1922 (S); Pahang, Rompin R., Lehan Chondong, EVANS s.n., July 1917 (K); Balok, 1, Singapore Field n. 207, June 1913 (S); Penor, common in old dunes and swards, CORNER s.n., Aug. 1935 (S); Katapang, RIDLEY 1236, May 1890 (S); Kuala Pahang, RIDLEY 1049, May 1890 (S); Kuala Tahan, 350 ft, SEIMUND 281 and 314, Nov. 1920 (S); S. Sat, Ulu Tembeling, HENDERSON, Singapore Field n. 21945, July 1929 (S); Pulau Tioman, Telok Paya, seashore, HENDERSON, Singapore Field n. 18431, May 1927 (B, S); id., Jaora Bay, very abundant, BURKILL s.n., June 1915 (S); Negri Sembilan, Gunong Beremban, ALVINS 1875, June 1885 (S); Selangor, Rantau Panjang, KLOSS 36, July 1914 (K); Malacca, GRIFFITH s.n. (K); ALVINS 19 (S); Tebong, BURKILL, Singapore Field n. 561, July 1914 (S); Johore, below Gunong Pulai, RIDLEY s.n. (S); S. Rhu Reba, CORNER, Singapore Field n. 28656, June 1934 (S); Singapore, HULLETT 5, Nov. 1885 (S); CANTLEY s.n. and 2865 (S); SYMINGTON 22987, July 1930 (S); Botanic Gardens, waste places, MD NUR s.n., June 1924 (S); Chanji, sandy sea coast, BURKILL s.n., Febr. 1913 (S); Ang Mo Kio, RIDLEY s.n. (S).

SUMATRA, without precise locality, KORTHALS 52, 127, 207 (L); East Coast, Simeloengoen, YATES 1869 (L); vic. of Medan, behind the beach, DOCTERS VAN LEEUWEN 3120, Febr. 1919 (B); Gedong djohore, S. of Medan, grassy sunny places, c. 50 m, LÖRZING 3518, Febr. 1915 (B); Sibolangit, not rare, c. 500 m, LÖRZING 4208, Jan. 1916 (B); Pematangsiantar, 750 m, WINCKEL 1220 $\beta$ , Febr. 1923 (B); E. of

Loeboekpakam, grassy dike of railroad, rare, c. 20 m, LÖRZING 3330, Oct. 1914 (B); Haboko estate, c. 150 m, DOCTERS VAN LEEUWEN 3180, Febr. 1919 (B); Tapanoeli, Toba, fort of Dolok Tolong, c. 1050 m, on open dry rocky soil, common, OUWEIAND 202, June 1896 (B); Toba highland, S. of Balige, near Tanga Batoe, on rocks, rare, 1200 m, HUPTEMA 100, Sept. 1931 (B); Oelocan, OUWEIAND 148, March 1896 (B); Upper Bila-plain, Aek-boero, bushes, c. 80 m, LÖRZING 9612, Apr. 1923 (B); West Coast, Padang, KORTILALS s.n. (L); id., sandy soil, without collector's name, n. 228, Apr. 1870 (B); Apenberg, JUNGHUIN, Aug. (L); Kajoe tanam, c. 130 m, BECCARI 836, Sept. 1872 (K, L); Sandaran agong, 2450 ft, ROBINSON and KLOSS s.n., May 1914 (K); Kerintji valley, c. 850 m, BÜNNEMEYER 8364, Febr. 1920 (B, L, S); near G. Malintang, alang field, 1150 m, BÜNNEMEYER 3758, July 1918 (B); foot G. Malintang, alang field, 780 m, BÜNNEMEYER 4420, Aug. 1918 (B); near Atar, riverside, KLEINHONTE 540, Aug. 1932 (B); Ophir district, 212 m, BÜNNEMEYER 261, Apr. 1917 (B); W. slope of Talaman, common, 350 m, BÜNNEMEYER 319, Apr. 1917 (B); Bt. Boekoe, S. of Baso, 900 m, BÜNNEMEYER 1243, June 1917 (B); Bengkoelen, Kroeï, CRAMER 123, Sept. 1915 (B); Lampoengs, Gedong-tetahan, 400 ft, FORBES 1287a (according to Journ. Bot. LXIII, Suppl. (1925) p. 71); Palombang, Batoe Pantjeh, on Moesi R., 350 ft, FORBES 2680 (L); Djambi, Doesoen Baroe, on Merangin R., 200 m, POSTIUMUS 859, Sept. 1925 (B, L, S); id., POSTIUMUS 891, Sept. 1925 (B); Riouw and Dependencies, Riouw Archipelago, P. Bintan, Lobam, 20 m, BÜNNEMEYER 6240, June 1919 (B, L, S, U); id., P. Bintan, S. Poelai, wayside, 40 m, BÜNNEMEYER 6350, June 1919 (B, L); Lingga Archipelago, P. Selajar, Gg. Selajar, beach, 5 m, BÜNNEMEYER 7408, Aug. 1919 (B, L); Anambas and Natoena Islands, Boengoeran, Ranai, sandy way, very common, 5 m, VAN STEENIS 1135, Apr. 1928 (B, L, S); Bangka and Dependencies, Bangka, AMAND s.n. (L, U); Muntok, wayside, common, 10 m, BÜNNEMEYER 1408, Oct. 1917 (B, L, S); Soengailiat, Beloetan, 70 m, BÜNNEMEYER 1618, Oct. 1917 (B); Soengailiat, Tiangtara, ladang, 60 m, BÜNNEMEYER 1868, Nov. 1917 (B); Soengailiat, Kp. Paritpadang, wayside, common, 80 m, BÜNNEMEYER 1927, Nov. 1917 (B, L).

JAVA, according to BACKER from W. to E. Java, in the lower parts, on rather light soil, on fields, grasslands, waste places, waysides. Without precise locality, HORSFIELD s.n. (K, L, U); JUNGHUIN s.n. (L); KORTILALS 122 (L); MILLET s.n. (K); NAGEL 182 (BD); PLOEM s.n. (B); REINWARDT s.n. (L); DE VRIESE s.n. (L); Bantam, Nieuw-Tjisalak estate, near Rangkasbitong, c. 60 m, DE VRIES 55, May 1922 (B); G. Kantjana, waysides, common, KOORDERS 41117 $\beta$ , June 1912 (B, L); between G. Kantjana and G. Kendeng, wayside, in grass, 300 m, BACKER 1296, June 1911 (B); G. Karang, 600 m, KOORDERS 40632 $\beta$ , May 1912 (B); between Panjawoen-gan and Bajak, in grass and thickets, BACKER 1603, June 1911 (B); Pasir Ajoenan, a common weed on shadeless spots, 150—200 m, BACKER 1949, June 1911 (B); Batavia, Batavia, VORDERMAN s.n. (B); Laanhof, BACKER 34194 (B); Sabangan near Weltevreden, BAKHUIZEN VAN DEN BRINK fil. 3677, May 1925 (B); Kebajoran near Mr. Cornelis, BACKER 34193, Jan. 1903 (B); Wanajasa, 500 m, BACKER 14352, June 1914 (B); Krawang, KORTILALS 102 (L); Tjikompai estate, E. of Poerwakarta, c. 110 m, HARMSSEN 95 (B); near Tjikoja, ZOLLINGER 141, June (BD, K, L); Buitenzorg, KUHIL and VAN HASSELT s.n. (L); id., BOERLAGE s.n., Febr. 1888 (L); id., cultivated in the Botanic Garden, TEYSMANN s.n. (L); id., id., n. XV. K. B. XII. 10 and XV. H. 40 (B); way to Kotabatoe, in hedges, HALLIER 208d, March 1893 (B); above Bandungan, railroad, HALLIER 208a, Apr. 1893 (B); near Baranan-

siang, in sweet-potatoe field, HALLIER 208c, May 1893 (B); near Waroeng mangga, HALLIER 208b, May 1893 (B); Moeara Tjiomas, BOERLAGE s.n., Sept. 1888 (L); Tjiomas, SOENGANDIREDA 112, March 1900 (B, L); Djasinga, in tea-plantation, 200 m, BACKER 10464, Dec. 1913 (B); Soekaboemi, dry fields, 400 m, BACKER 15075, July 1914 (B); between Tjipeujeum and Radjamadjala, alang field, 300 m, BACKER 13451, May 1914 (B); Tjiloea, 150 m, BACKER 22200, Jan. 1917 (B); Tjitjoeroeg, Djam-pang-koelon, sunny wayside, 325 m, BACKER 17263, Nov. 1914 (B); Tjiratjap, Djam-pang-koelon, 100 m, BACKER 17459, Nov. 1914 (B); Tjidaoen near Palaboehan, beach, KOORDERS 34666 $\beta$ , Apr. 1899 (B, L); Priangan, Bandjar, Bantar dawa, BACKER 34271, Dec. 1910 (B); Bandjar-Sindanglaja (?); SCHEFFER s.n., Oct. 1871 (B); isl. Noesagede, lake of Pendjaloe, Tasikmalaja, 720 m, KOORDERS 47913 $\beta$ , Aug. 1917 (B); Babakan, LEIMANN s.n. (BD); Cheribon, Tjipetir, WENT and DE MONCHY s.n., May 1890 (L); id., DE MONCHY s.n. (B); between Haoergeulis and Tjipoenegara, railroad, 25 m, BACKER 16829, Oct. 1914 (B); Pekalongan, Soebah, virgin forest, KOORDERS 36903 $\beta$ , May 1899 (B, K, L); Banjoemas, Banjoemas, KIEVITS 3261 (Pa); hills between Banjoemas and Mandirantjang, KIEVITS, Banj. 95, Oct. 1923 (Pa); Poerbolingo, hills, 125 m, DENKER 25, June 1911 (B, L, U); Pringombo, KOORDERS 27179 $\beta$ , Apr. 1897 (B); Semarang, Semarang, DE VISSER SMITS s.n. (B); Djapara-Rembang, Ngarengan, teak-wood, KOORDERS s.n., Jan. 1886 (B); id., KOORDERS 33504 $\beta$ , May 1899 (B); id., KOORDERS 33509 $\beta$ , May 1899 (B); id., KOORDERS 35603 $\beta$ , May 1899 (B); G. Moerja, c. 400 m, DOCTERS VAN LEEUWEN 955, Oct. 1912 (B); Bandjaran, BEUMÉE 661, Sept. 1916 (B); Jogjakarta, near Jogjakarta, in rice-field, JUNGHUHN s.n., Apr. (L); Goenoeng Gamping, JUNGHUHN s.n., Apr. (L); Madioen, near Ngebel, grasslands, 800 m, KOORDERS 29874 $\beta$ , March 1898 (B); Kediri, E. Wilis, hedges, c. 600 m, LÖRZING 805, Febr. 1914 (B); Gadoengan Pare, KOORDERS 22994 $\beta$ , May 1896 (B, L); Soerabaja, Madjakerta, DORGELO 1899, June 1923 (Pa); Malang, Kepoeh, S.W. of Pasoeroean, wayside, 75 m, BREMEKAMP 8309, June 1913 (B, BD, L); Nongkodjadjar, M. Tengger, cultivated, 1230 m, BUYSMAN 2913, Nov. 1909 (U); Probolinggo, beach, ALTMANN 497, Aug. 1935 (B); Besoeki, between Pantjoer and Pradjekan, very dry volcanic sterile soil, rare, 400 m, KOORDERS 32403 $\beta$ , Dec. 1898 (B); Ringgit, thickets, 3 m, CLASON C. 82, May 1931 (B); Poeger, KOORDERS 21018 $\beta$ , Oct. 1895 (B); Bondowoso, mouth of Kali Soekamade, BOOBERG s.n., Sept. 1936 (B); id., CLASON s.n., Sept. 1936 (B); Madoera, Bangkalan, alang fields, many specimens, 10 m, BACKER 19008, Febr. 1915 (B); Tanahmerah, hedges, 50 m, BACKER 19396, Febr. 1915 (B); Boernih, hedge, 10 m, BREMEKAMP s.n., May 1917 (B); Kangean-islands, Kangean, Kajoe Waroe, sandy field, 1 m, BACKER 28206, Apr. 1919 (B); Saboenten isl., Saboenten, thickets, 10 m, BACKER 29912, May 1919 (B); P. Mamboerit, sandy soil, frequent, 1 m, BACKER 27262, March 1919 (B); Sepandjang, grassland, frequent, 1—5 m, BACKER 28811, Apr. 1919 (B); id., fields, 1—2 m, BACKER 29167, Apr. 1919 (B); Bangko, grassland, 2 m, BACKER 29216, Apr. 1919 (B); Sapeken, plains behind the beach, frequent, 1 m, BACKER 29289, Apr. 1919 (B); Sapapan, grassland, 5 m, BACKER 28457, Apr. 1919 (B); Saoebi, grassland, 2 m, MAILLMEISTER (?), 6, March, 1919 (B); Paliat, in grass and thickets, frequent, 1 m, BACKER 29353, May 1919 (B).

BORNEO, without precise locality, KORTHALS 174, 185 (L); W. division, Singkawang, Pasir Pandjang, near Pontianak, Miss POLAK 267, Dec. 1930 (B); Sanggau, HALLIER 729 (B); Benkajang, DUNSELMAN 42, July 1936 (B); Karimata islands, P. Karimata besar, ladang, MONDI 199, March 1931 (B, K, L, S); S. and

E. division, Bandjermasin, MOTLEY 931 (K); Martapoera, KORTHALS 124 (L); Pagat, GRABOWSKY s.n., Nov. 1887 (?) (BD); Doesoen, KORTHALS 122 (L); according to MERRILL, 1921, also in British North Borneo: TOPPING 1482.

CELEBES, Manado, Manado, 10 m, KOORDERS 16552 $\beta$ , Dec. 1894 (B, L); near Amoerang, KOORDERS 16550 $\beta$ , March 1895 (B, BD, K, L); Tonsawang, KOORDERS 16551 $\beta$ , March 1895 (B, L); Celebes and Dependencies, S.W. Celebes, Lombasang, wayside, 950 m, BÜNNEMEYER 11151, Apr. 1921 (B); id., id., 1000 m, BÜNNEMEYER 11394, Apr. 1921 (B); Bontoparang, RACHMAT 5, exp. VAN VUUREN, June 1913 (B); id., wayside, 50 m, BÜNNEMEYER 10579, March 1921 (B); id., wayside, 50 m, BÜNNEMEYER 10628, March 1921 (B); id., wayside, 50 m, BÜNNEMEYER 10662, March 1921 (B, K, L); Malino, wayside, 280 m, BÜNNEMEYER 10761, Apr. 1921 (B, U); Mamodjoe, RACHMAT 209, exp. VAN VUUREN, July 1913 (B); Maleiro, wayside, 280 m, BÜNNEMEYER 10871, Apr. 1921 (B); Bae bae, ladangs, 50 m, KJELLBERG 106, Febr. 1929 (B); Boeton, Bae bae, coral-limestone, 0—75 m, ELBERT 2629, Sept. 1909 (L); Moena, Lombai, 0—30 m, ELBERT 2944, Aug. 1909 (L); Toekangbesi Islands, dry spots, ELBERT 2565, July 1909 (L); Watamponi, NOERKAS 209, exp. VAN VUUREN, May 1912 (B, L); Tanette, wayside, 500 m, BÜNNEMEYER 12538, June 1921 (B, L); Salajar, TEYSMANN 13888 (B); S. Salajar, thickets on beach, DOCTERS VAN LEEUWEN 1910, May 1913 (U); Bonerate, c. 50 m, DOCTERS VAN LEEUWEN 1445, May 1913 (B, U); marble island near T. Djampea, DOCTERS VAN LEEUWEN 1604, May 1913 (B, U); Kalao, behind the beach, DOCTERS VAN LEEUWEN 1533, May 1913 (B, U).

LOMBOK, Ekas, on shrubs, 10 m, Mrs. RENSCH 420, Apr. 1927 (B, BD); Rindjani, N.E.-slope, Sembaloen-plateau, 1185—1265 m, ELBERT 1506, May 1910 (L).

SOEMBAWA, Sentoal, COLFS 121, Nov. 1879 (L); Bima, Doro-Roepah, near Waworada Bay, 200—400 m, ELBERT 3849, Dec. 1909 (L); Dompoe, dry thickets, frequent, 80 m, Mrs. RENSCH 850, May 1927 (BD).

TIMOR, without precise locality, GAUDICHAUD s.n. (BD); REINWARDT 1300 (L); SPANOGHE 48 (L); duplicate specimens from the Paris herbarium, without collector's name (BD, L); Roti, SPANOGHE s.n. (L).

MOLUCCAS, Ternate, Tabahawa, field, BEGUIN 992, Oct. 1920 (B); Boeroe, Leksoela, 30 m, TOXOPEUS s.n., Aug. 1921 (B, L); Ceram, Selor, garden near beach, KORNASSI 896, Jan. 1918 (B, BD, L, P, U); S.E. Ceram, Kilmoeri, garden near beach, KORNASSI 754, Jan. 1918 (B, L, U); Ceramlaoet (according to WARBURG, 1891); Amboina, LESSON 103 (BD); ROBINSON 1824, July-Nov. 1913 (B, K, L); Soja di bawa, TREUB 562 (B, mixed with *Merremia hirta* (L.) MERRILL); G. Nona, BOERLAGE 94, July 1900 (B); Karang pandjang, RANT 231, June 1929 (B, mixed with *Merremia hirta* (L.) MERRILL); Timorlaoet, RIEDEL s.n. (K); Kai-islands, JAHIERI 300 (B).

NEW GUINEA, Dutch New Guinea, Merauke, KOCH s.n., Aug. 1904 (B, L); id., along field, VERSTEEG 1866, Nov. 1907 (B); Papua, Port Moresby, GOLDIE (according to VON MUELLER, 1876); id., sea shore, CARR 11852; Apr. 1935 (L); Thursday Island, JAHIERI s.n., May 1901 (B).

PHILIPPINE ISLANDS, according to MERRILL throughout the Philippines in open grasslands at low altitudes, usually common; Luzon, prov. Benguet, Baguio, ELMER 8963, March 1907 (B, K, L); id., Sablang, FÉNIX, Bur. of Sc. 12678, Nov.-Dec. 1910 (S); prov. Nueva Vizcaya, vicinity of Dupax, MCGREGOR, Bur. of Sc. 11341 and 11399, March-Apr. 1912 (L); prov. Zambales, Curran, For. Bur. 5853, Jan. 1907

(B); prov. Bataan, Lamao River, Mt. Mariveles, MERRILL 3105, Oct. 1903 (BD, K); id., ELMER 7030, Nov. 1904 (K); id., MEYER, For. Bur. 2503, Jan. 1905 (B, BD, K, S); prov. Rizal, RAMOS, Bur. of Sc. 13589, Aug. 1911 (B, BD, L); id., RAMOS 1981, Nov. 1914 (B, BD, L, S); id., Antipolo, MERRILL 83, Jan. 1910 (U); id., Manila, PERROTTET s.n. (L); id., San Francisco del Monte, LOHER 4164, Oct. 1891 (BD); prov. Laguna, Los Baños, ELMER 8128, Apr. 1906 (B, K); prov. Sorsogon, Irosin, Mt. Bulusan, ELMER 17171, Sept. 1916 (B, BD, K, L, U); Mindoro, Baco, MERRILL 1268 and 1270, Jan. 1903 (BD); isl. of Paragua, Point Separation, MERRILL 830, Febr. 1903 (BD); Mindanao, Bukidnon subprov., vicinity of Tanculan, FÉNIX, Bur. of Sc. 26073, July 1916 (B, S); prov. Agusan, Cabadbaran, Mt. Urdaneta, ELMER 13513, Aug. 1912 (B, BD, K, L, U); Tawitawi Isl., RAMOS and EDAÑO, Bur. of Sc. 44196, July-Aug. 1924 (B, S).

**Distribution:** Tropical East Africa, tropical Asia from the Khasia Hills and Bengal southwards to Ceylon, eastwards and southwards to China, the Malay Peninsula, the Malay Archipelago and tropical Australia.

**Vernacular names:** akar kurumak (Malay Peninsula, RIDLEY), kankong paya (Malay Peninsula, ALVINS); karok relia (Malay Peninsula, Singapore Field n. 207), pungulang (Malay Peninsula, GIMLETTE); sanem-sanem (Mal., Sumatra, Padang); kangkong rimboe (Sund., Sumatra, Padang); akar tali tali (Sumatra, West Coast, Ophir district, BÜNNEMEYER); toelan dalin (Sumatra, Djambi, POSTHUMUS); klitang, djangoet boang (Bangka, BÜNNEMEYER); irit-iritan (Java, Djapara-Rembang, KOORDERS); rangitan (Java, Djapara-Rembang, BEUMÉE); pakissan rambat (Java, Kediri, KOORDERS); kitjoke (Madur., Java, Besoeke, KOORDERS); mawow-entoet (Tontemboan language, Minahassa, KOORDERS); loeré-loeré (Celebes, Bontoparang, RACHMAT); dongi-dongi (Celebes, Gg. Boting, RACHMAT); kradjok (Celebes, Bontoparang, BÜNNEMEYER); lilah kali sarang (Celebes, Mamoedjoe, RACHMAT); djala ma toeboe (Ternate, BEGUIN); goewi djala (Tidore, BEGUIN); sapoetangan doewa (= two handkerchiefs, a fantastic name, according to BACKER; Ceram, KORNASSI); karadkad (Philipp., Igorot language, MERRILL); maragta, talanuk (Philipp., Tagalog language, MERRILL); tatalon (Philipp., Manobo language, MERRILL); sigid (Philipp., Panay Bisaya language, MERRILL).

**Use:** "The leaf is made into poultice and applied to the head in cases of jungle fever" (Malay Peninsula, according to a note on a label, by ALVINS). Leaves used as a medicine in the Karimata islands, according to a label-note made by MONDI.

**Remarks.** 1. In ENGLER's *Botanische Jahrbücher* XVIII, 1894, p. 117 and 118, HALLER distinguishes *Merremia angustifolia* (JACQ.) HALL. f. with its var. *ambigua* HALL. f. and *M. hastata* (DESR.) HALL. f., giving short descriptions of these species. Later on in his manuscripts



in the library of the Rijksherbarium at Leiden, the same author unites the two species with a third one, *Merremia tridentata* (L.) HALL. f. under the name of the latter. The three species now get the rank of varieties. Typical *M. tridentata* is named *M. tridentata* var. *genuina* HALL. f. mss. inedit.; *M. angustifolia*: *M. tridentata* var. *angustifolia* (JACQ.) HALL. f. mss. inedit. and *M. hastata*: *M. tridentata* var. *hastata* (DESR.) HALL. f. mss. inedit.. The present author wishes to give to these three taxonomical units the rank of subspecies, under the name of ssp. *genuina* (HALL. f.) VAN OOSTSTR.; ssp. *angustifolia* (JACQ.) VAN OOSTSTR.<sup>1)</sup> and ssp. *hastata* (DESR.) VAN OOSTSTR.

2. According to HALLIER the var. *ambigua*, mentioned above, is identic with *Convolvulus filicaulis* VAHL, a species described just as *Merremia angustifolia* from Africa (Guinea). Now it is a remarkable fact that it is evident both from his description ("laciniis calicinis acuminatis") and from the specimens in the Leiden Herbarium bearing his handwriting, that BLUME, making the combination *Ipomoea filicaulis* (VAHL) BL., Bijdr. (1825) p. 721 (= *Convolvulus filicaulis* VAHL) used this name for Malaysian specimens only, namely for specimens belonging to var. *hastata* (ssp. *hastata* m.). After BLUME the name *I. filicaulis* was among others used by CHOISY, ZOLLINGER and MIQUEL (CHOISY in Mém. Soc. Phys. Genève VI (1833) p. 448; id. in DC., Prodr. IX (1845) p. 353; ZOLL., Syst. Verz. 2. Heft (1854) p. 129; MIQ., Fl. Ned. Ind. II (1857) p. 603; id., Suppl. (1860) p. 235, 561). CHOISY used it for African and American as well as for Asiatic and Malaysian specimens. The specimens mentioned by ZOLLINGER and MIQUEL are all of Malaysian origin. It is evident that these authors did not distinguish the varieties in the sense of HALLIER, but united the material under one name. The same may be said of those authors who used the name *Ipomoea angustifolia* JACQ. for Asiatic, Malaysian and Australian specimens, as there are BENTHAM, CLARKE, FORBES, WARBURG, TRIMEN, MANSON BAILEY and GAGNEPAIN & COURCHET (BENTH., Fl. Austr. IV (1869) p. 425; CLARKE in HOOK., Fl. Brit. Ind. IV (1883) p. 205; FORBES, Wander. Germ. ed. II (1886) p. 222; WARB., in ENGL., Bot. Jahrb. XIII (1891) p. 412; TRIMEN, Handb. Fl. Ceyl. III (1895) p. 217; MANSON BAILEY, Queensl. Fl. IV (1901) p. 1065; id., Compr. Cat.

<sup>1)</sup> *M. tridentata* (L.) HALL. f. ssp. *angustifolia* (JACQ.) VAN OOSTSTR., nov. ssp. — *Ipomoea angustifolia* JACQ., Collect. II (1788) p. 367; id., Icon. Rar. II (1786—93) p. 10, t. 317.

Queensl. Pl. (1909) p. 349; GAGNEP. et COURCH. in LEC., Fl. Indo-Chine IV (1915) p. 265).

7. *Merremia quinquefolia* (L.) HALL. f. in ENGL., Bot. Jahrb. XVI (1893) p. 552; id. in Versl. 's Lands Pl. t. 1895 (1896) p. 127; BOERL., Handl. Fl. Ned. Ind. II (1899) p. 509 — *Ipomoea quinquefolia* L., Spec. Pl. (1753) p. 162; GRISEB. in Mem. Am. Acad. N. S. VIII (1863) p. 526 — *Convolvulus quinquefolius* L., Syst. ed. 10 (1759) p. 923 — *Batatas quinquefolia* (L.) CHOISY in Mém. Soc. Phys. Genève VIII (1837) p. 49; id. in DC., Prodr. IX (1845) p. 339.

A herbaceous twiner; the stems slender, terete, striate or sulcate, glabrous or sparsely to densely hirsute with patent hairs. Leaves petiolate, petiole thin, glabrous or with few patent hairs, 2—5, occasionally to 9 cm long, limb palmately compound, with 5 leaflets, leaflets glabrous, sessile or shortly petiolulate, oblong or narrow-oblong to lanceolate or sometimes still narrower, attenuate towards both ends, the apex acute or obtusish, mucronulate, the margins coarsely dentate to undulate or almost entire; length of leaflets 2.5—6 cm; width 0.5—2 cm, the middle leaflet longer than the lateral ones. Inflorescences axillary, to c. 12 cm long; peduncles shorter to longer than the petioles, 4—7 cm, glandular upwards, the glands occasionally mixed with patent bristly hairs, 1-flowered or cymosely branched, and then 3- or sometimes to 5-flowered, the branches of the cyme glandular like the peduncle; pedicels glabrous or with some glands near the base, 5—7, sometimes to 15 mm long, in fruit to 15—20 mm and then thickened at the top. Bracts small, narrow-triangular, acute, about 1.5 mm long. Flower-buds ovoid, acute. Sepals narrow-ovate to oblong, obtuse, mucronulate, glabrous, subequal in length or the outer ones shorter, outer sepals 4—6, inner ones 6—8 mm long, slightly enlarged in fruit. Corolla pale yellow or white, funnel-shaped, 18—25 mm long, glabrous. Filaments inserted about 4 mm above the corolla base, glabrous except the broadened and shortly pubescent base; anthers spirally twisted. Ovary glabrous, style filiform, glabrous, stigma biglobular. Disk low, slightly lobed. Fruit a globose, straw-coloured capsule, opening by 4 valves, 4-celled, 4-seeded; valves c. 9 mm long; seeds black or greyish black, c. 4.5 mm long, shortly hairy with appressed curled hairs.

SUMATRA, Lampoenigs, Bergen Estate, common in the forest, cultivated on the estate, Administrator of Bergen Estate 9, July 1934 (B).

JAVA, Buitenzorg, Buitenzorg, cultivated in the Botanic Garden, TEYSMANN (L); id., n. XVI. A. 4 and 4A (according to HALLIER); id., X. G. 153 (L); id., XV. H. 45 and XV. K. B. XIII. 11 (B); id., HALLIER C 13c, July 1893 (L); Besoeki,

Gerengredjo near Rambipoedji, foot of Yang, 50 m, coll. of the Experim. Station of Besoeki, June 1934 (B).

Moluccas, without precise locality, but most probably in Halmahera, FORSTEN s.n. (B, L); Ternate, N. Castila, c. 40 m, BEGUIN 1605, May 1921 (B).

Distribution: Tropical America, Malay Archipelago (escaped from culture?).

Vernacular name: raeo tjanga (Ternate, BEGUIN).

Remarks: 1. According to notes on some collectors' labels (Administrator of Bergen Estate; Experim. Station of Besoeki) a very rapid grower, in a very short time covering all other plants. Perhaps of some value in culture as a cover crop.

2. *Merremia quinquefolia* is a species of American origin, which, however, was found already about 1840 in the Moluccas, probably in Halmahera, by FORSTEN.

8. *Merremia tuberosa* (L.) RENDLE in THIS-DYER, Fl. Trop. Afr. IV, 2 (1905) p. 104 — *Ipomoea tuberosa* L., Spec. Pl. (1753) p. 160, non LOUR.; CHOISY in DC., Prodr. IX (1845) p. 362, excl. syn. STEUD.; MIQ., Fl. Ned. Ind. II (1857) p. 607 — *Convolvulus tuberosus* (L.) SPRENG., Syst. I (1825) p. 591, non VELL. — *Batatas tuberosa* (L.) BOJ., Hort. Maurit. (1837) p. 226 (not seen) — ? *Convolvulus paniculatus* BLANCO, Fl. Filip. (1837) p. 96 — *Operculina tuberosa* (L.) MEISSN. in MART., Fl. Bras. VII (1869) p. 212; HALL. f. in ENGL., Bot. Jahrb. XVI (1893) p. 476, 549; id., l.c. XVIII (1894) p. 119; id. in Versl. 's Lands Pl. t. 1895 (1896) p. 128; BOERL., Handl. Fl. Ned. Ind. II (1899) p. 510; HALL. f. in Bull. Herb. Boiss. VII (1899) p. 410; PRAIN in Journ. As. Soc. Bengal LXXIV (1906) p. 308; RIDLEY, Fl. Malay Penins. II (1923) p. 463; MERRILL, Enum. Philipp. Fl. Pl. III (1923) p. 363 — *I. nuda* PETER in ENGL.-PRANTL, Nat. Pfl. fam. IV, 3a (1891) p. 31 — *I. Glaziovii* DAMMER in ENGL., Bot. Jahrb. XXIII (1897) Beibl. n. 57, p. 40 (according to HALL. f. in Bull. Herb. Boiss. VII (1899) p. 410).

A quite glabrous perennial twiner. Stems from a large subterraneous tuber, robust, terete, finely striate, about 4—7 mm thick. Leaves orbicular in outline, 6—16 cm long and broad, palmately divided to far below the middle, segments 7, oblong-lanceolate, acuminate at the apex, gradually narrowed to the base, entire, the middle segment larger than the lateral ones; petiole slender, 6—18 cm long. Peduncles several-flowered, axillary, terete or more or less applanate above, 4—15 cm long; pedicels clavate, 15—18 mm long; bracts small, triangular, about 2 mm long. Two exterior sepals 23—25 mm long, ovate to broad-ovate, obtuse,

with an indistinct very small mucro, the three interior ones narrower, oblong, the third about as long as the first and second, the fourth and fifth a little shorter, about 21—22 mm. Corolla yellow, funnel-shaped, glabrous, 5.5 cm long. Stamens inserted 4 mm above the base of the corolla, unequal in length, varying from 5—8 mm; anthers linear, twisted, 5 mm long. Style filiform, about 14 mm long; stigmas globose, papillose. Capsule 4- or less-seeded, large, the 4-seeded ones subglobose or depressed globose, about 3.5 cm in diam., the less-seeded ones elliptic, elliptic-globose or oblique-elliptic, with a smaller diameter; the capsule opens more or less irregularly by valves, the pericarp moreover loosens circularly at its base (see remarks), the wall is thin, straw-coloured, chartaceous; the capsule enclosed by the much enlarged sepals and borne by a stout clavate pedicel. Sepals in fruit to 5 or 6 cm long, the tips recurved, the pedicels to 5 cm long. Seeds large, about 17 mm long, black with a black pubescence on the sides and with somewhat longer, black hairs along the margins, glabrescent.

MALAY PENINSULA, Singapore, cultivated, HULLETT 645 (according to PRAIN l.c.); according to RIDLEY l.c. *M. tuberosa* "was formerly cultivated in the Botanic Garden, Singapore, and spread as far as across the road opposite, but has, I believe, now quite disappeared".

SUMATRA, West Coast, Fort de Kock, cultivated, Oct. 1930, JACOBSON 85 (B).

JAVA, Buitenzorg, Buitenzorg, cultivated in the Botanic Garden n. XV. H. 41 and 41A, according to HALLIER, 1896. A specimen collected near Buitenzorg, by BAKHUIZEN VAN DEN BRINK (7850), July 1931 (L) is probably escaped from culture; Malang, Bantoer, S. of Kepandjen, cultivated, July 1927, BACKER 36308 (Pa).

PHILIPPINE ISLANDS, according to MERRILL, 1923, occasionally cultivated.

Distribution: Probably of tropical American origin; distributed through tropical Africa, the Mascarene Islands, British India, Ceylon, cultivated and occasionally escaped in the Malay Peninsula and the Malay Archipelago.

Remarks. 1. Of this species I could examine in the collection of the Rijksherbarium at Leiden two fruiting specimens, one collected by HALLIER in the Botanic Garden at Buitenzorg and one of African origin. The fruits of the African specimen are subglobose or somewhat depressed globose, and 4-seeded. They show the limits of the valves quite distinctly by darker lines, and open quite regularly by 4 valves, which moreover loosen from the receptacle at their very base. The fruits from Buitenzorg are partly 4-seeded and subglobose, partly they are less-seeded and more elliptic or even oblique-elliptic. They show, in the same way as the African ones, the limits between the valves, marked by darker lines; the dehiscence of these valves is, however, as far as I

can see, not so regular. When the capsule opens, the pericarp loosens as a whole from the receptacle, while the valves remain in connection with each other. Moreover the capsule can show some more or less irregular splits, irregular, as they do not always correspond with the original limits of the valves. Though the capsule wall loosens here, as has been described above, as a whole, at its base from the receptacle and forms in this way a kind of "operculum", this "operculum" is completely different from that, known in the genus *Operculina*. In *Operculina* we have a fruit of which the wall shows two distinct layers, the outer one of these layers, the epicarp, is more or less fleshy in the upper part (the lid, operculum) and is circumscissile, while the endocarp which is scarious, remains at first entire and splits at length irregularly. After this explanation it is clear that there is no reason to unite the genera *Merremia* and *Operculina* as has been done by some authors, for instance by BAKER and RENDLE in the Flora of Tropical Africa. These authors, in describing the genus *Merremia*, say that they "cannot distinguish generically the larger-flowered and fruited species which have been regarded as forming a distinct genus *Operculina*. The transverse dehiscence of the fruit is not general in this small group." We see, however, that the way in which the capsule opens is surely of importance and that this characteristic is a sufficient one in distinguishing the two genera.

2. HASSKARL mentions a var. *oligantha* HASSK., Retzia I (1855) p. 69. He describes this var. with the following words: pedunculis pauci-(6—7-)floris, petiolo brevioribus, sepalis in alabastro acuminatim convolutis, foliorum lobis acuminatissimis. *Folia* 3—5 poll. longa, 3½—7 poll. transversim lata *corolla* aurea 2 poll. alta et 2½ poll. diametro in limbo; *calyx* glaberrimus, in anthesi convolutus, connivens, in fructu patentissimus siceus, sepalis apice subrevolutis, 2 poll. fere longis; *fructus* pericarpium pergamaceum vix hinc inde in suturis valvarum dehiscens, demum basi solutum, operculatim deciduum; loculi 2-, abortu 1-spermi; *semina* nigra velutina, 8 lin. longa, 4 lin. lata, antice plana dorso convexa.

The type of this var. is unknown to me; the description undoubtedly refers to a plant which hardly differs from typical *Merremia tuberosa*. HASSKARL states that specimens of his variety were introduced in Java from Sydney, and that the natives call it Aroij kawoijang.

9. *Merremia aegyptia* (L.) URB., Symb. Antill. IV (1910) p. 505; GAMBLE, Fl. Pres. Madras V (1923) p. 928 — *Ipomoea aegyptia* L., Spec. Pl. (1753) p. 162 — *Convolvulus pentaphyllus* L., Spec. Pl. ed. 2

(1762) p. 223 — *Ipomoea pentaphylla* (L.) JACQ., Collect. II (1788) p. 297; id., Ic. Plant. Rar. II (1786—93) p. 10, t. 319; CLARKE in HOOK., Fl. Brit. Ind. IV (1883) p. 202; GAGNEP. et COURCH. in LEC., Fl. Indo-Chine IV (1915) p. 239 — *Batatas pentaphylla* (L.) CHOISY in Mém. Soc. Phys. Genève VI (1833) p. 436; id. in DC., Prodr. IX (1845) p. 339; MIQ., Fl. Ned. Ind. II (1857) p. 600; id., Suppl. (1860) p. 235 — *Merremia pentaphylla* (L.) HALL. f. in ENGL., Bot. Jahrb. XVI (1893) p. 552; id. in ENGL., Bot. Jahrb. XVIII (1894) p. 115; BOERL., Handl. Fl. Ned. Ind. II (1899) p. 510; COOKE, Fl. Bombay II (1905) p. 239; BAKER and RENDLE in THIS.-DYER, Fl. Trop. Afr. IV, 2 (1905) p. 108; DUTHIE, Fl. Upper Ganget. Pl. II (1911) p. 110; HALL. f. in Meded. Rijksherb. Leiden 1 (1911) p. 21; KOORDERS, Exk. fl. Java III (1912) p. 113 — *Operculina aegyptia* (L.) HOUSE in Bull. Torr. Bot. Club XXXIII (1906) p. 502.

Twinner. Stems slender, terete, hirsute with many yellow-brown patent hairs. Leaves palmately compound, with 5 leaflets, the leaflets sessile, elliptic or elliptic-oblong, entire, acute or acuminate at the apex, acute at the base, appressed pilose on both surfaces, 2.5—10 cm long and 1—4 cm broad; petiole slender, as long as or longer than the blade, patently hirsute, 2.5—12 cm long. Peduncles patently hirsute, few- to several-flowered, 5—24 cm long; bracts small, lanceolate, 2—4 mm long, deciduous; pedicels patently hirsute, 10—25 mm long. The 3 outer sepals ovate-lanceolate, acute or acuminate, 15—25 mm long, densely hirsute, the 2 inner ones glabrous, ovate, acute, slightly shorter. Corolla 2.5—3.5 cm long, funnel-shaped, white, glabrous. Anthers spirally twisted. Ovary glabrous, 4-celled. Capsule globose, glabrous, 4-celled, 4-valved, 4-seeded. Seeds glabrous.

JAVA, cultivated (according to KOORDERS).

Distribution: Tropical America, tropical Africa, India, Pacific Islands.

10. *Merremia dissecta* (JACQ.) HALL. f. in ENGL., Bot. Jahrb. XVI (1893) p. 552 (*M. dissecta*); id. in ENGL., Bot. Jahrb. XVIII (1894) p. 114; id. in Versl. 's Lands Pl. t. 1895 (1896) p. 127; BOERL., Handl. Fl. Ned. Ind. II (1899) p. 509; COOKE, Fl. Bombay II (1905) p. 240; BAKER and RENDLE in THIS.-DYER, Fl. Trop. Afr., IV, 2 (1905) p. 104; DUTHIE, Fl. Upper Ganget. Pl. II (1911) p. 110; GAMBLE, Fl. Pres. Madras V (1923) p. 928 — *Convolvulus dissectus* JACQ., Obs. II (1767) p. 4; id., Hort. Vindob. II (1772) p. 74, t. 159 — *Ipomoea dissecta* (JACQ.) PERS. in L., Syst. ed. XV (1797) p. 207, in nota, non WILLD.; PURSH, Fl. Am. Sept. I (1814) p. 145 — *I. sinuata* ORTEGA, Hort. Matr.

Dec. VII (1798) p. 84; CHOISY in DC., Prodr. IX (1845) p. 362; CLARKE in Hook., Fl. Brit. Ind. IV (1883) p. 214; MANSON BAILEY, Queensl. Fl. IV (1901) p. 1058; id., Compr. Cat. Queensl. Pl. (1909) p. 347 — *Operculina dissecta* (JACQ.) HOUSE in Bull. Torr. Bot. Club XXXIII (1906) p. 500.

Twiner. Stems slender, terete, striate, patently hirsute, glabrescent. Leaves palmately divided nearly to the base, with 5—7 lanceolate, mucronulate, coarsely dentate to irregularly pinnately lobed segments, glabrous or hairy on the veins beneath, the middle segment 2.5—10 cm long, 0.5—3 cm broad, the lateral ones and especially the basal ones smaller; petiole 2.5—7 cm long, patently hirsute like the stems. Peduncles patently hirsute, glabrescent in the upper portion, 1- or few-flowered, 5—10 cm long; pedicels thickened above, 1.5—2 cm long, glabrous, minutely verrucose at the top. Flower-buds narrow-ovoid, acute. Sepals large, ovate-lanceolate, acute, mucronulate, glabrous, subequal, 2—2.5 cm long, herbaceous with narrow scarious margin, afterwards enlarged and coriaceous in fruit. Corolla 3—3.5 cm long, funnel-shaped, white, with a rose or purple throat, the limb with 5 distinct bands. Anthers spirally twisted. Disk cup-shaped. Ovary glabrous, 2-celled. Capsule globose, glabrous, 2-celled, 4-valved, normally 4-seeded. Seeds glabrous.

JAVA, Buitenzorg, Buitenzorg, cultivated in the Botanic Garden, HALLIER C. 162a, Oct. 1894 (L); Madoera, Sapoeloe, cultivated, BACKER 21115, June 1916 (B).

Distribution: Probably indigenous only in America: Southern United States, Central America, West Indies, South America to Argentina and Uruguay; Africa: Upper Guinea, Cordofan, Seychelles; becoming naturalized in British India, as a garden escape; also in Australia: Queensland.

11. *Merremia vitifolia* (BURM. f.) HALL. f. in ENGL., Bot. Jahrb. XVI (1893) p. 552; id. in Versl. 's Lands Pl. t. 1895 (1896) p. 127; id. in Bull. Herb. Boiss. V (1897) p. 379; BOERL., Handl. Fl. Ned. Ind. II (1899) p. 509; COOKE, Fl. Bombay II (1905) p. 239; PRAIN in Journ. As. Soc. Bengal LXXIV (1906) p. 303; MERRILL and ROLFE in Philipp. Journ. Sc. III (1908) p. 122; KOORDERS, Exk. fl. Java III (1912) p. 113; KOORDERS-SCHUM., Syst. Verz. (1910—13) Conv. p. 3; BOLD., Zakfl. (1916) n. 832; MERRILL in Philipp. Journ. Sc. XIX (1921) p. 374; id. in Journ. Roy. As. Soc. Str. Br. Spec. Numb. (1921) p. 509; GAMBLE, Fl. Pres. Madras V (1923) p. 928; RIDLEY, Fl. Malay Penins. II (1923) p. 457; MERRILL, Enum. Philipp. Fl. Pl. III (1923) p. 362; BEUMÉE in Hand. 3e N. I. Natuurw. Congr. (1924) p. 178; RENDLE in Journ. Bot. LXIII,

Suppl. (1925) p. 71; BACKER, Onkruidfl. Jav. Suikerrietgr. (1931) p. 517 — *Convolvulus vitifolius* BURM. f., Fl. Ind. (1768) p. 45, t. 18, fig. 1; ROXB., Fl. Ind. II (1824) p. 61 (not seen); WALL, Cat. (1828) n. 1348; ROXB., Fl. Ind. I (1832) p. 476 (*C. vitifolius* WILLD.) — *C. angularis* BURM. f., Fl. Ind. (1768) p. 46, t. 19, fig. 2; HASSK., Pl. Jav. Rar. (1848) p. 519 (*C. angularis* L.) — *Ipomoea vitifolia* (BURM. f.) BLUME, Bijdr. (1825) p. 709; CHOISY in Mém. Soc. Phys. Genève VI (1833) p. 454; id. in DC., Prodr. IX (1845) p. 361; ZOLL., Syst. Verz. 2. Heft (1854) p. 129; MIQ., Fl. Ned. Ind. II (1857) p. 607; CLARKE in Hook., Fl. Brit. Ind. IV (1883) p. 213; FORBES, Wander., Germ. ed. II (1886) p. 222; WARB. in ENGL., Bot. Jahrb. XIII (1891) p. 413; TRIMEN, Handb. Fl. Ceyl. III (1895) p. 224; GAGNEP. et COURCH. in LEC., Fl. Indo-Chine IV (1915) p. 269 — *Convolvulus pilosus* NORONH., Verhand. Batav. Gen. V (1827) p. 71, nomen nudum (ex HASSK.) — *Ipomoea angularis* (BURM. f.) CHOISY in Mém. Soc. Phys. Genève VI (1833) p. 454 — *I. vitifolia* (BURM. f.) BLUME var. *angularis* (BURM. f.) CHOISY in DC., Prodr. IX (1845) p. 361; MIQ., Fl. Ned. Ind. II (1857) p. 607.

A large twiner; the stems terete, the older ones striate, 2—4 m (BACKER), glabrous or patently hirsute with long white or fulvous hairs. Leaves petiolate, the petiole short or long, 2—15 cm long, or occasionally longer, with patent hairs like the stems or glabrous; the blade orbicular in outline, cordate at the base, palmately 5—7-lobed, the lobes broad-triangular to lanceolate, more or less acuminate or acute to obtuse at the apex and mucronulate, mostly not contracted at the base or sometimes slightly so, coarsely dentate to crenate or subentire, sparsely to densely hairy on both sides, more densely beneath than above, or glabrous above; total leaf-blade 5—18 cm long and 5—16 cm broad. Inflorescences axillary, pedunculate, the peduncles shorter or longer than the petiole, 1—15 cm or more, patently hirsute, 1—3- or several-flowered; bracts small, subulate, 1.5—2 mm; pedicels hirsute like the peduncles, 8—20 mm long, thickened above, clavate in fruit. Flower-buds narrow-ovoid, acute. Sepals oblong to ovate-oblong, obtuse or acutish, mucronulate, the outer ones more or less hirsute, glabrescent, the inner ones glabrous, all with glandular pellucid dots, 12—20, in fruit to 20 or 25 mm long and then thick, subleathery, whitish inside and with many glandular pits. Corolla bright-yellow, funnel-shaped, glabrous; the midpetaline bands distinctly 5-nerved, the limb with 5 obtuse lobes; length of corolla 5—6 cm, or sometimes less; width of limb c. 7 cm. Anthers spirally twisted. Ovary globose, glabrous. Disk low, annular. Capsule subglobose, papery, straw-



coloured, about 12 mm high, 4-valved, 4- or less-seeded. Seeds 6—7 mm, black or blackish-brown, opaque, glabrous.

MALAY PENINSULA, according to RIDLEY common on river banks, creeping in sand and over bushes. Perak, Batu Gajah, BURKILL and HANIFF, Singapore Field n. 13369, June 1924 (S); Kuala Kangsar, RIDLEY s.n., March 1892 (S); Ipoh, very common, BURKILL, Singapore Field n. 2781, Nov. 1917 (S); Pahang, Kuala Tahan, 350 ft, SELMUND 36, Nov. 1920 (S); Bentong, c. 300 ft, BURKILL and HANIFF, Singapore Field n. 16421, Nov. 1924 (S); Lubu (Lubok) Pelang, RIDLEY s.n., Aug. 1891 (S); Gali near Raub, BURKILL and HANIFF, Singapore Field n. 16819, Nov. 1924 (S). According to RIDLEY also in Perlis and in Kelantan.

SUMATRA, East Coast, Gedong djohore, S. of Medan, thickets, frequent, c. 50 m, LÖRZING 3519, Febr. 1915 (B); Tandjoeng, Karoland, thickets, LÖRZING 9008, May 1922 (B); West Coast, Doekoe, KORTIALS 250 (L); W. slope of Talakman, Ophir district, common, 300 m, BÜNNEMEYER 306, Apr. 1917 (B); near Soekamenanti, Ophir district, along field, bushes, 120 m, BÜNNEMEYER 207, Apr. 1917 (B); Lampoengs, Teloekebetoeng, ELBERT s.n. (L); Isl. Sebesi, frequent, DOCTERS VAN LEEUWEN 5379, Apr. 1921 (B); id., N.E.-side, frequent, DOCTERS VAN LEEUWEN 5208, Apr. 1921 (B); Palembang, Batoe-Pantjeh, 550 ft, FORBES 2651 (BD, L).

JAVA, according to BACKER from West to East Java, from the lowlands to the lower parts of the mountains, in parts with a faint as well as in parts with a rather strong east monsoon, in thickets and hedges and along waysides. Without precise locality, BLUME s.n. (B, L, U); VAN HALL 110 and 255 (L); MILLET s.n. (K); Bantam, between G. Kendeng and Malingping, wayside, in thickets, 100—300 m, BACKER 1305, June 1911 (B); Sadjira, thickets, 100—150 m, BACKER 2136, June 1911 (B); Pandeglang, thickets, 200 m, BACKER 7435, March 1913 (B); Batavia, BACKER 35438 (B); near Weltevreden, JUNGHUHN 33 and 35 (L); waterfall near Tjikao, BLUME 1220 (L); Sentiong, BACKER 35439 (B); between Kota Bamboe and Djembatan Doeren, BACKER 35437 (B); Tanahabang, hedges, HALLIER s.n., Aug. 1896 (B); Kerendang, BACKER 35436, June 1903 (B); Bidaratjina, EDELING s.n. (B); G. Parang near Poerwakarta, thickets, 500 m, BACKER 13960, June 1914 (B); Tjikoja, thickets, ZOLLINGER 431, Aug. (BD, K, L); Buitenzorg, Buitenzorg, KUHL and VAN HASSELT 155, June (L); id., HALLIER 209a, March 1893 (B); Waroeng mangga, HALLIER s.n., Sept. 1896 (B); Tji Seeng, Koeripan, limestone rock, 125 m, BACKER 25475, July 1918 (B); near Tjiomas, frequent, 350 m, BAKHUIZEN VAN DEN BRINK 4054, Aug. 1920 (B); Tjiomas, BOERLAGE s.n., Sept. 1888 (L); Sinang barang, BOERLAGE s.n., Nov. 1888 (L); Tjinaroea, Tjibodas, RAAP 900, July 1894 (L); G. Katé near Soekaboemi, edge of sec. forest, 400 m, BACKER 15064, July 1914 (B); Tjitjoeroeg, Djampang-koelon, thickets, 325 m, BACKER 17265, Nov. 1914 (B); Tjisokan, PLOEM s.n. (B); Tjampea, KUHL and VAN HASSELT 153, July (L); Palaboehan, PLOEM (19767) (B); id., 50 m, KOORDERS 34671 $\beta$ , Apr. 1899 (B); Palaboehan Ratoe, BOERLAGE s.n., July 1888 (L); Tjiloea, near Zandbaai, thickets, 25—50 m, BACKER 25630, Aug. 1918 (B); Priangan, PLOEM s.n. (L); Bandoeng, JAGOR 520 (BD); id., VAN DER VEEN s.n., herb. v. O. 821, Sept. 1923 (L); valley of Tjitaroem, disafforested summit, c. 600 m, HOCHREUTNER 1666, July 1904 (Genève); above Padalarang, limestone hills, VAN STEENIS 5091, Sept. 1931 (B); Bandjar, thickets, 50—100 m, BACKER 4260, Aug. 1912 (B); Soekaradja near Tasikmalaja, thickets, 250 m, BACKER 8482, Aug. 1913 (B); Cheribon, G. Tjerimai, thickets, 760 m, BACKER

4825, Oct. 1912 (B); Pekalongan, near Gringsing, 10 m, KOORDERS 36861 $\beta$ , May 1899 (B, L); between Dara and Bandar, thickets, 300 m, BACKER 15600, Sept. 1914 (B); forestry E. Tegal, teak-wood, 40 m, BEUMÉE 4378, Aug. 1919 (B); Magelang, Temanggoeng, rather rare, waste places, c. 550 m, LÖRZING 588, Aug. 1912 (B, BD); Semarang, Tjandi, dry hills, 100 m, DOCTERS VAN LEEUWEN 594, Aug. 1912 (B); between Weleri and Soebah, thickets, frequent, 1 m, BACKER 16557, Sept. 1914 (B); Daroepana, teak-wood, 100 m, BACKER 16434, Sept. 1914 (B); near Kedoengdjati, KOORDERS 24507 $\beta$ , Sept. 1896 (B, L); id., KOORDERS 24530 $\beta$ , Sept. 1896 (B, L); id., KOORDERS 25044 $\beta$ , Sept. 1896 (B); id., KOORDERS 25057 $\beta$ , Sept. 1896 (B); Djapara-Rembang, Ngarengan, KOORDERS 33510 $\beta$ , May 1899 (B); Bandjaran, edge of forest, BEUMÉE 660, Sept. 1916 (B); id., BEUMÉE 716, Sept. 1916 (B); Padangan, thickets, BEUMÉE 999, Aug. 1917 (B); forestry Nanas, teak-wood, c. 100 m, BEUMÉE 5341, Aug. 1920 (B); Jogjakarta, G. Gambing, JUNGHUHN s.n., Oct. (L); G. Prambanan, forest, JUNGHUHN s.n., Aug. (L); Madioen, Ngawi, 300 ft, SOERADJI 12, May 1918 (B); lake of Ngebel, 730 m, WISSE 743, Sept. 1921 (B); near Ngebel, KOORDERS 29193 $\beta$ , Aug. 1897 (B, BD, L); Patjitan (according to MIQUEL, 1857, p. 607), HORSFIELD Conv. 19 (K); Kediri, forestry Krondong, teak-wood on marl, 125 m, GRUTTERINK 3083, July 1918 (B); Soerabaja, Soerabaja, DORGELO 779, Aug. 1922 (Pa); Koepang near Soerabaja, 20 m, BREMEKAMP s.n. (B); Malang, Tengger, 400 m, BUYSMAN 210, Aug. 1907 (U); foot of Tengger, teak-wood Kepoeh, c. 150 m, BLIJHOUWER 37, Nov. 1932 (B); S. of Bantoer, Gondanglegi, 200 m, BACKER 3925, June 1912 (B); G. Baoeng, near Lawang, 400 m, BLIJHOUWER 77 (B); Besoeki, Poeger, thickets, 5—10m, BACKER 18259, Dec. 1914 (B); id., KOORDERS 21069 $\beta$ , Oct. 1895 (B); id., KOORDERS 21077 $\beta$ , Oct. 1895 (B); id., KOORDERS 21128 $\beta$ , Oct. 1895 (B, L); id., sandy soil, 10 m, KOORDERS 21078 $\beta$ , Oct. 1895 (B); Soemberwringin, E. of Bondowoso, sec. thickets, frequent, 700—750 m, BACKER 9473, Oct. 1913 (B); Litjin, virgin forest, 400 m, KOORDERS 43184 $\beta$ , July 1916 (B); Pantjoer, virgin forest, KOORDERS 28509 $\beta$ , Aug. 1897 (B, L); between Pantjoer and Pradjekan, sterile, volcanic, very dry soil, KOORDERS 32408 $\beta$ , Dec. 1898 (B); Tjoeramanis, virgin forest, KOORDERS 28756 $\beta$ , Sept. 1897 (B); G. Idjen, N.-slope, above Bajeman, thickets, 500 m, BACKER 24981, June 1918 (B); Djember, ULTÉE 7 (B); Madoera, Kangean-islands, Kangean, Ardjasa, 25 m, BACKER 27225, March 1919 (B); id., Kangean, Kalikatak, DOMMERS 101, Sept. 1919 (B).

BORNEO, S. and E. division, Bandjermasin, MOTLEY 310.(K).

CELEBES, Celebes and Dependencies, Lombasang, wayside, 950 m, BÜNNEMEYER 11148, Apr. 1921 (B); id., BÜNNEMEYER 11365, May 1921 (B); Raelo near Lombasang, 950 m, BÜNNEMEYER 11279, May 1921 (B); Boeloe Tanah, wayside, 750 m, BÜNNEMEYER 11436, May 1921 (B, L); Bonto Leroeng, wayside, 600 m, BÜNNEMEYER 11789, May 1921 (B, L); Tanette, edge of forest, 400 m, BÜNNEMEYER 11744, May 1921 (B); Boeloe Parigi, wayside, 560 m, BÜNNEMEYER 12477, June 1921 (B, U); Pangkadjene, on rocks, TEYSMANN 11799, 11962, 11967, 12433 (B); id., id., TEYSMANN 12102 (B, L); Bonthain, TEYSMANN 13931 (B, L); Tjampalagiang, RACHMAT 245, exped. VAN VUUREN, July 1913 (B); Papang, RACHMAT 246, exped. VAN VUUREN, July 1913 (B); Salajar, thickets, c. 300 m, DOCTERS VAN LEEUWEN 1702 (B, U).

FLORES, Mborong, thickets, 100 m, DE VOOGD 2832, Sept. 1936 (B).

TIMOR, without precise locality, RIEDLÉ s.n. (P); SPANOGHE s.n. (L); Koepang,

TEYSMANN s.n. (B); Portuguese Timor, Hato-lia, frequent, Mrs. WALSH 508, July 1929 (B).

MOLUCCAS, Ternate, Foramadiahi, thickets, c. 300 m, BEGUIN 1620, May 1921 (B); Boeroe, Leksoela, c. 25 m, TOXOPEUS 13, Febr. 1921 (B, L); id., c. 30 m, TOXOPEUS s.n., Aug. 1921 (B, L); Amboina, ROBINSON 1826, July-Nov. 1913 (B, K, L); Kai-islands, JAHIERI 278, 307 (B); Klein Kai (according to WARBURG); Timorlaet, RIEDEL s.n. (K).

PHILIPPINE ISLANDS, according to MERRILL in open grasslands, deserted clearings, and thickets at low altitudes. Without precise locality, LOHER 6580 (BD); Luzon, prov. Laguna, ROBINSON, Bur. of Sc. 9717, Febr. 1910 (B, BD, K, L); id., RAMOS, Bur. of Sc. 22467, March 1915 (B, L, S); id., Mt. Maquiling, MERRILL 6300, Febr. 1909 (BD, L); Negros, Cabancalan, MERRILL 206, Apr. 1910 (U); Palawan, Puerto Princessa, Mt. Pulgar, ELMER 12880, March 1911 (B, BD, K, L, P, U); Taytay, MERRILL 9185, Apr. 1913 (K); Balabac, MANGUBAT, Bur. of Sc. 483, March-Apr. 1906 (B, BD); Paragua, E-wi-g River, MERRILL 733, Febr. 1903 (BD).

Distribution: From British India and Ceylon to Indo-China, the Malay Peninsula and the Malay Archipelago.

Vernacular names: akar lulang bulu (Malay Peninsula, RIDLEY); ulan raya (Malay Peninsula, BURKILL and HANIFF); areuj kawojang, aroi kawoejang, aroi kawajang (Sund., BACKER, BLUME, BOERLAGE, KOORDERS); ginda pura utan (ginda poera oetan) (Java, BURMAN); katapong (Java, JUNGHUHN); tampar kidang (Jav., Pekalongan, KOORDERS); ojob kotong, katong (Jav., Semarang, KOORDERS); samber kidang (Djapara-Rembang, BEUMÉE); dewoeloe, pos sepo, soc-boeloe (Madur., Besoekei, KOORDERS); rabet boeloe (Kangean Arch., DOMMERS); taradjoe, leaves: obat locka (Celebes, Tanette, BÜNNEMEYER); tjamboeloe-boeloe (Celebes, Tjampalagiang, RACHMAT); kai-kai mamia (Celebes, Papang, RACHMAT); kalalakmit (Philipp., Sulu language, MERRILL).

Remarks. The outer part of the sepals often wine-red (LÖRZING).

### Section 3. *Xanthips* (GRISEB.) HALL. f.

HALL. f. in ENGL., Bot. Jahrb. XVI (1893) p. 552; id. in ENGL., Bot. Jahrb. XVIII (1894) p. 112 — *Ipomoea* L. sect. *Xanthips* GRISEB., Fl. Brit. West Ind. Isl. (1864) p. 470.

Flower-buds ovoid, obtuse or subacute; midpetaline bands of the corolla indistinctly limited, never with dark lines; flowers of moderate size.

12. *Merremia umbellata* (L.) HALL. f. in ENGL., Bot. Jahrb. XVI (1893) p. 552; id. in ENGL., Bot. Jahrb. XVIII (1894) p. 114; id. in Versl. 's Lands Pl. t. 1895 (1896) p. 127; id. in Meded. 's Lands Pl. t. XIX (1898) p. 545; BOERL., Handl. Fl. Ned. Ind. II (1899) p. 509;

COOKE, Fl. Bombay II (1905) p. 237; BAKER and RENDLE in THIS-DYER, Fl. Trop. Afr. IV, 2 (1905) p. 106; MERRILL in Philipp. Journ. Sc. I (1906) Suppl. p. 120; id., Fl. Manila (1912) p. 389; KOORDERS, Exk. fl. Java III (1912) p. 112; KOORD.-SCHUM., Syst. Verz. (1914) p. 110; BOLD., Cat. Hort. Bog. (1914) p. 161; id., Zakfl. Java (1916) n. 836; MERRILL, Interpr. Rumph. Herb. Amb. (1917) p. 440; GAMBLE, Fl. Pres. Madras V (1923) p. 928; RIDLEY, Fl. Malay Penins. II (1923) p. 459; MERRILL, Enum. Philipp. Fl. Pl. III (1923) p. 362; HEYNE, Nutt. Pl. ed. 2 (1927) p. 1301; HENDERSON in Gardens' Bull. Str. Settle. IV (1928) p. 293 — *Convolvulus umbellatus* L., Spec. Plant. (1753) p. 155 — *C. cymosus* DESR. in LAM., Encycl. III (1791) p. 556 — *C. bifidus* VAHL, Symb. Bot. III (1794) p. 30 — *Ipomoea umbellata* G. F. W. MEY., Prim. Fl. Esseq. (1818) p. 99; CHOISY in DC., Prodr. IX (1845) p. 377 — *I. Heynii* R. et S., Syst. IV (1819) p. 237 — *I. Rothii* R. et S., Syst. IV (1819) p. 237 — *I. cymosa* (DESR.) R. et S., Syst. IV (1819) p. 241; CHOISY in Mém. Soc. Phys. Genève VI (1833) p. 461; Bot. Reg. (1843) t. 24; CHOISY in DC., Prodr. IX (1845) p. 371; ZOLL., Syst. Verz. 2. Heft (1854) p. 129; MIQ., Fl. Ned. Ind. II (1857) p. 613; BENTH., Fl. Austr. IV (1869) p. 423; F.-VILL., Novis App. (1880) p. 141 (not seen); CLARKE in Hook., Fl. Brit. Ind. IV (1883) p. 211; FORBES, Wander., Germ. ed. II (1886) p. 222; VIDAL y SOLER, Rev. Plant. Vasc. Philipp. (1886) p. 196; SCHUM.-HOLLR., Fl. Kaiser Wilh. Land (1889) p. 115<sup>1)</sup>; WARB. in ENGL., Bot. Jahrb. XIII (1891) p. 412; PRAIN in Journ. As. Soc. Bengal LXIII (1894) p. 108; TRIMEN, Handb. Fl. Ceylon III (1895) p. 219; SCHUM.-LAUTERB., Fl. Deutsch. Schutzgeb. (1901) p. 516; MANSON BAILEY, Queensl. Fl. IV (1901) p. 1063; id., Compr. Cat. Queensl. Pl. (1909) p. 349; KOORDERS-SCHUM., Syst. Verz. (1910—13) Conv. p. 4; GAGNEP. et COURCH. in LEC., Fl. Indo-Chine IV (1915) p. 251 — *I. bifida* (VAHL) R. et S., Syst. IV (1819) p. 241 — *Convolvulus blandus* ROXB., Fl. Ind. II (1824) p. 70 (not seen); WALL., Cat. (1828) n. 1342; ROXB., Fl. Ind. I (1832) p. 470 — *C. pentagonus* ROXB., Fl. Ind. II (1824) p. 72 (not seen); WALL., Cat. (1828) n. 1343; ROXB., Fl. Ind. I (1832) p. 485 — *C. Rothii* (R. et S.) SPRENG., Syst. I (1825) p. 600 — *Ipomoea cymosa* (DESR.) R. et S. var. *pilosa* CHOISY in Mém. Soc. Phys. Genève VI (1833) p. 462; id., in DC., Prodr. IX (1845) p. 371; MIQ., Fl. Ned. Ind. II (1857) p. 613 — *I. cymosa* (DESR.) R. et S. var. *sagittato-angulata* CHOISY l.c. p. 463 — *I. cymosa* (DESR.) R. et S. var. *sagittata* CHOISY in DC., Prodr. IX (1845) p. 371; MIQ., Fl. Ned. Ind.

<sup>1)</sup> According to WARBURG, 1891, the specimen HOLLRUNG 809 does not belong here.

II (1857) p. 613 — *I. sepiaria* auct., non KOEN.; ZOLL. et MOR., Syst. Verz. (1845—46) p. 51 — *I. modesta* CHOISY in ZOLL., Syst. Verz. 2. Heft (1854) p. 129, 131; MIQ., Fl. Ned. Ind. II (1857) p. 614 — *I. cymosa* (DESR.) R. et S. var. *typica* PRAIN in Journ. As. Soc. Bengal LXIII (1894) p. 108 — *Merremia umbellata* (L.) HALL. f. var. *orientalis* HALL. f. in Versl. 's Lands Pl. t. 1895 (1896) p. 132; id. in Bull. Soc. Roy. Bot. Belgique XXXV (1896) p. 270; id. in Bull. Herb. Boiss. V (1897) p. 375, 381; BOERL., Handl. Fl. Ned. Ind. II (1899) p. 509; HALL. f. in Bull. Herb. Boiss., sér. 2, I (1901) p. 675; PRAIN in Journ. As. Soc. Bengal LXXIV (1906) p. 306; HALL. f. in ENGL., Bot. Jahrb. XLIX (1913) p. 379; id. in Meded. Rijksherb. Leiden 35 (1918) p. 5; MERRILL in Journ. Roy. As. Soc. Str. Br. Spec. Numb. (1921) p. 509; id., Enum. Philipp. Fl. Pl. III (1923) p. 362; BACKER, Onkruidfl. Jav. Suikerrietgr. (1931) p. 516 — *M. cymosa* (DESR.) BAKER and RENDLE in THIS-DYER, Fl. Trop. Afr. IV, 2 (1905) p. 106. Fig. 1, p; fig. 2, A—I.

Stems herbaceous or the older parts woody, the young parts with white milky juice, twining or prostrate and rooting, slender, terete, or slightly striate, covered with a soft pubescence or glabrescent or glabrous, 1—3 m long (BACKER). Leaves petiolate, the petiole with soft short hairs or glabrous, variable in length, 1.5—6 cm; the blade very variable in form and size, 4—12(—16) cm long and 1—6.5(—9) cm broad, ovate, ovate-oblong or oblong, more or less acuminate at the apex with obtuse, mucronulate point, more or less cordate at the base or rounded to truncate, the auricles rounded or angular, occasionally hastate, the lower surface sparsely to very densely covered with short, soft, greyish or whitish hairs, the upper surface mostly less densely hairy to glabrous; lateral nerves 5—7(—9) on each side of the midrib, tertiary nerves many, subparallel. Inflorescences axillary, the peduncle generally short, 1—4 (rarely to 7 cm) long, mostly densely pubescent, mostly cymosely branched at the top with short to very short branches; flowers mostly in few- to many-flowered umbelliform cymes, rarely solitary; bracts minute, lanceolate, deciduous; pedicels mostly longer than the calyx, sparsely pubescent to glabrous. Flower-buds ovoid, obtuse or acutish. Sepals slightly unequal, the outer ones somewhat shorter than the inner or subequal, very concave, broad-elliptic or orbicular, emarginate, mucronulate, the inner ones scarious at their margin, 5—7(—8) mm long, glabrous or the outer ones sparsely pilose, often pectinately erose and slightly enlarged in fruit. Corolla funnel-shaped, slightly lobed, white or yellowish to orange (see Remarks), 2—3, sometimes to 3.5 cm long, glabrous except the upper parts of the midpetaline bands. Filaments

inserted about 5 mm above the corolla base, unequal, short; anthers straight, sagittate. Disk slightly 5-lobed. Ovary conical, glabrous or with some hairs at the top, style glabrous. Capsule ovoid to conical, mucronulate by the base of the style, glabrous or with some hairs at the top, 10–12 mm high, c. 8 mm in diam., 4-valved, the valves lanceolate to narrow-ovate, splitting from the base, 4- or less-seeded; seeds c. 5 mm long, densely hairy with long, soft, patent hairs.

MALAY PENINSULA, according to RIDLEY common in thickets in open country, marshy ground. Perlis, Gua Nangka, HENDERSON, Singapore Field n. 23071, Nov. 1929 (S, mixed with *Jacquemontia paniculata* (BURM.f.) HALL.f.); prov. Wellesley, Tasek Gelugor, RIDLEY s.n., Dec. 1895 (S); Muda River, "common about villages everywhere in the north of prov. Wellesley", BURKILL 3072 (S); Penang, WALLICH s.n. (S); WALLICH 1343 (K); Bukit Padie, CURTIS 1083, Oct. 1886 (K, S); cultivated in the Botanic Gardens, Md. NUR s.n., May 1919 (S); Dindings, RIDLEY s.n., March 1896 (S); Perak, CANTLEY s.n. (S); Kuala Kangsar, RIDLEY s.n., March 1892 (S); Taiping, RIDLEY s.n., Febr. 1892 (S); id., HENDERSON, Singapore Field n. 10245, Jan. 1923 (S); Lahat, RIDLEY s.n., Febr. 1890 (S); Ipoh, CUMMIS s.n., Dec. 1895 (S); Pahang, Pekan, RIDLEY s.n., Aug. 1891 (S); Lubok Paku, Pahang River, BURKILL and HANIFF, Singapore Field n. 16106, Nov. 1924 (S); Kuala Lipis, BURKILL and HANIFF, Singapore Field n. 15702, Nov. 1924 (S); Budu, BURKILL and HANIFF, Singapore Field n. 15808, Nov. 1924 (S); Negri Sembilan, S. base of Tampin hill, BURKILL, Singapore Field n. 1445, Jan. 1916 (S); Tampin, on Kuala Pitah road, BURKILL, Singapore Field n. 2806, Nov. 1917 (S); Selangor, GOODENOUGH s.n., March 1899 (S); Kuala Lumpur, RIDLEY s.n., Dec. 1920 (K); Klang, secondary jungle, FOX s.n., Dec. 1888 (S); Malacca, MAINGAY 1149 (in K also numbered 2966), Febr. 1868 (K, L); ALVINS 62 (S); Belimbing, BURKILL, Singapore Field n. 2802, Nov. 1917 (S); Chinana Puteh, ALVINS 849, Febr. 1885 (S); Kesang Batu, HERVEY s.n., Sept. 1890 (S); Johore, Bukit Muar, FIELDING s.n. (S); Kota Tinggi, RIDLEY s.n., Dec. 1892 (S); Singapore, Sepoy Lines, RIDLEY 11956, Febr. 1904 (S).

SUMATRA, without precise locality, KORTHALS 232 (L); DIEPENHORST 1345HB (B); Atjeh and Dependencies, P. Breuëh (P. Bras), LEHMANN 19, Dec. 1889 (BD); valley Aloer Lampahan, secondary forest, wayside, VAN STEENIS 6073, Aug. 1934 (B); East Coast, Upper Bilaplain, Aek-boero, thickets and young forest, rather frequent, c. 80 m, LÖRZING 9578, Apr. 1923 (B); Aek-boero, young forest, not rare, c. 80 m, LÖRZING 9638, Apr. 1923 (B); Pematangsiantar, 750 m, WINCKEL 1231, Febr. 1923 (B); valley of Betimoes, near Doerian-tani, N. of Sibolangit, thickets, c. 350 m, LÖRZING 10190, Febr. 1924 (B); N.W. of Medan, thickets and grasslands, sunny places, frequent, c. 16–18 m, LÖRZING 3698, Apr. 1915 (B); Gedong djohore, S. of Medan, thickets and grasslands, not rare, c. 50 m, LÖRZING 3530, 3572, Febr. 1915 (B); Haboko estate, wayside, c. 150 m, DOCTERS VAN LEEUWEN 3184, Febr. 1919 (B); id., DOCTERS VAN LEEUWEN 3185, Febr. 1919 (B, L); Tapanoeli, Nias, VON RÖMER XI (B); id., VON RÖMER XVII (B, mixed with *Merremia pellata* (L.) MERRILL); West Coast, Ophir district, mountain-ridge S.W. of Taloe, edge of forest, common, 800 m, BÜNNEMEYER 135, Apr. 1917 (B); Pi Nagar, wayside, forest, c. 210 m, BÜNNEMEYER 238, Apr. 1917 (B); Talakmau, W. slope, common,

BÜNNEMEYER 336, Apr. 1917 (B); id., 350 m, BÜNNEMEYER 337, Apr. 1917 (B); Padang, KORTHALS 232 (L); Ajer mantjoer, c. 360 m, BEOCARI 720, Aug. 1878 (K, L); Pariaman, DIEPENHORST† 2131 H. B. (B); Padangpandjang, MATTHEW s.n., Jan. 1913 (K); Tjoebadah, thickets, common, 700 m, BÜNNEMEYER 72, Apr. 1917 (B); G. Malintang, N.W. slope, edge of forest, frequent, c. 1100 m, BÜNNEMEYER 3505, July 1918 (B, L, S, U); Kerintji, Kp. Baroe, wayside, 850 m, BÜNNEMEYER 8054, Febr. 1920 (B); Kerintji, Ajer Anim, thickets, wayside, 900 m, BÜNNEMEYER 7998, Febr. 1920 (B, L, S); lake of Kerintji, wayside, 800 m, BÜNNEMEYER 8302, Febr. 1920 (B); Scolak Dras, 3000 ft, ROBINSON and KLOSS s.n., March 1914 (K); Sanggaranagoeng, 2450 ft, ROBINSON and KLOSS s.n., May 1914 (K); Benkoelen, Benkoelen, 5 m, AJOEB 29, expedition JACOBSON, June 1916 (B); Enggano, Meok, edge of forest, thickets, LÜTJEHARMS 3838C, May 1936 (L); Lampoengs, Kota agoeng, CRAMER 121, 122, Aug. 1915 (B); Palembang, Palembang, PRAETORIUS 163 (L); Martapoera, along field, BAL 29, Febr. 1930 (B); id., BAL 51, Febr. 1930 (B); Djambi, Bangko, wayside, sunny place, 60 m, POSTHUMUS 485, July 1925 (B, L, S); Doesoen Baroe, forest, c. 200 m, POSTHUMUS 878, Sept. 1925 (B, L, mixed with *Merremia tridentata* (L.) HALL.f. ssp. *hastata* (DESR.) VAN OOSTSTR.; U); id., edge of forest, c. 200 m, POSTHUMUS 887, Sept. 1925 (B); Bangka and Dependencies, Toboali, Bentja, common, 90 m, BÜNNEMEYER 2237, Dec. 1917 (B).

JAVA, according to BACKER from West to East Java, in the lowlands and the lower mountainous region, in hedges, thickets, along edges of forests. Without precise locality, BLUME 42 (L); HILDEBRAND s.n. (BD); HORSFIELD s.n. (L, U); HORSFIELD, Conv. 4 (K); KORTHALS 233 (L); MILLET s.n. (K); PLOEM s.n. (B); PLOEM 208 (BD); REINWARDT s.n. (L); ZOLLINGER 119 (BD, K, L); Bantam, Prinseneiland, KEULEMANS s.n. (L); between Sadjira and Lebak, KÜHL and VAN HASSELT 281, Aug. (L); Rangkasbitoeng, thickets, frequent, 50 m, BACKER 1086, June 1911 (B); between Rangkasbitoeng and Tjileles, thickets, frequent, 50—130 m, BACKER 1125, June 1911 (B); Pasir Ajoenan, 150—200 m, BACKER 1944, June 1911 (B, mixed with *Bonamia semidigyna* (ROXB.) HALL.f.); Tjibioek estate, Pandeglang, VELDEERS s.n., July 1922 (B); Bodjongmanik, KOORDERS 40789 $\beta$ , June 1912 (B, L); id., G. Liman, KOORDERS 40926 $\beta$ , June 1912 (B); G. Kantjana, KOORDERS 41205 $\beta$ , June 1912 (B); id., KOORDERS 41401 $\beta$  (B, L); Batavia, Batavia, PIEPERS s.n. (B); between Weltevreden and Batavia, thickets on riverbank, c. 5 m, BACKER 33291, Aug. 1902 (B); Laanhof, S.W. of Weltevreden, hedges, 15 m, BACKER 33290, July 1902 (B); S.W. of Pesing, grasslands, thickets, hedges, frequent, BACKER 33293, Febr. 1905 (B); Meester Cornelis, thickets, hedges, 20 m, BACKER 33292, July 1903 (B); Bidara tjina, S. of Meester Cornelis, 20—25 m, EDELING† s.n. (B); ZOLLINGER 1452, type of *Ipomoea modesta* CHOISY (= *I. sepiaria* auct., non KOEN.) (BD); Tjikoempaj estate, E. of Poerwakarta, c. 110 m, HARMSSEN 32, Aug. 1921 (B); Wanajasa, S. of Poerwakarta, waste places, wayside, frequent, 600 m, BAKHUIZEN VAN DEN BRINK 4812, July 1920 (B, L); Krawang, Tjikampek, teak-wood, 50 m, BEUMÉE 4553, Nov. 1919 (B); Buitenzorg, Depok, c. 90 m, KOORDERS 31153 $\beta$  (prob. var. *occidentalis*), Sept. 1898 (B); id., KOORDERS 31154 $\beta$ , Aug. or Sept. 1898 (B, L); id., KOORDERS 44005 $\beta$ , June 1917 (B); id., forest, KOORDERS 44072 $\beta$ , July 1918 (B); id., SOEGADIREDA 277, May 1900 (B); id., SMITH and RANT 685, Oct. 1911 (B); Buitenzorg, KÜHL and VAN HASSELT 55, 74, 75, 78 (L); cultivated in the Botanic Garden, n. XV. H. 4; XV. H. 4a (var. *occidentalis*); XV. H. 7; XV. H. 7a (B); id., HALLIER C. 163a, Aug. 1894 (L); id., HALLIER D. 206a and D. 206b, May and July 1893 (B); banks of

Tjiliwoeng near Buitenzorg, HALLIER 206b and 206c, Apr. 1893 (B); Waroeng Mangga, 250 m, HALLIER 206a, May 1893 (B); Panaragan, wayside, c. 230 m, VAN STEENIS 5455, July 1933 (B); Kota Batoe, c. 350 m, SOEGADIREDA 180, Apr. 1900 (B); way to Tjilaboet, frequent, 200 m, BAKHUIZEN VAN DEN BRINK 2359, Aug. 1919 (B); Batoe toelis, without collector's name n. 286 (L); near Tjampea, KÜHL and VAN HASSELT 84 (L); id., frequent, 500 m, BAKHUIZEN VAN DEN BRINK 1153, Sept. 1916 (B); S. of Leuwiliang, thickets, frequent, c. 400 m, BACKER 26003, Sept. 1918 (B); Tjinaroa, Tjibodas, RAAP 912, July 1894 (L); G. Salak, N.W.-slope near G. Boender, thickets, c. 750 m, BACKER 33289, Aug. 1909 (B, L); Tjidadap, S. of Tjibeber, waste places and edge of forest, 1000 m, BAKHUIZEN VAN DEN BRINK 2876, March 1917 (B); Tjidasmalang near Tjidadap, forest, frequent, 1000 m, WINCKEL 1830 $\beta$ , Nov. 1923 (B, L); Batoe Karoet, Tjidadap, forest, frequent, WINCKEL 392 $\beta$ , July 1919 (B, L, U); G. Boeleud, Tjidadap, forest, rather frequent, 1000 m, WINCKEL 1723 $\beta$ , Oct. 1913 (B, L); G. Tjileuer, W. of Buitenzorg, on tree and shrubs, on limestone, 250 m, VAN STEENIS 1729, July 1928 (B); Tjileboet, BOERLAGE s.n., Oct. 1888 (L); S. of Tjipetir, on shrubs, c. 500 m, WISSE 891, Aug. 1922 (B); Tjibadak, grassy slopes, frequent, 400 m, BACKER 25664, Aug. 1918 (B); Tjiagrek, S. of Batoetoelis, thickets, frequent, c. 450 m, BACKER 33288, June 1910 (B); Takokak, 1000 m, KOORDERS 15031 $\beta$ , Febr. 1894 (B); Palaboehan, young forest, 50 m, KOORDERS 34667 $\beta$ , Apr. 1899 (B); Palaboehanratoe, BOERLAGE s.n., July (L); S. of Djasinga, hills, thickets and young second. forest, frequent, 200 m, BACKER 23467, Febr. 1918 (B); Lengkong, thickets, frequent, 600 m, BACKER 17102, Nov. 1914 (B); G. Boerangrang, N.W.-slope, edge of forest, 1000 m, BACKER 14258, June 1914 (B); N. of Soekaboemi, thickets, BACKER 14782, July 1914 (B); Priangan, PLOEM s.n. (L); Bandoeng, VAN DER VEEN s.n., herb. v. O. 7248, Sept. 1923 (L); N. and N.E. of Bandjar, thickets, frequent, 50 m, BACKER 4652, Sept. 1912 (B); G. Sawal, S. slope above Tjikong, sunny thickets, 550 m, BACKER 8460, Aug. 1913 (B); between Radjamandala and Tjipeujeum, in grass, 300 m, BACKER 13445, May 1914 (B); Nanggerang, S.W. of Tasikmalaja, second. thickets, frequent, 900—1000 m, BACKER 8774, Aug. 1913 (B); Noesagede, lake of Pandjaloe, 720 m, KOORDERS 47917 $\beta$ , July 1917 (B); Cheribon, between Haoergeulis and Tjipoenegara, 25 m, BACKER 16848, Oct. 1914 (B); Tjibogo, JUNGHUHN 58, June (L); Pekalongan, between Dara and Bandar, thickets, frequent, 300 m, BACKER 15608, Sept. 1914 (B); Soebah, virgin forest, KOORDERS 36864 $\beta$ , May 1899 (B, L); forestry E. Tegal, teak-wood, edge of thickets and clearings, 40 m, BEUMÉE 4387, Sept. 1919 (B); id., in young teak-wood, on marl, 80 m, BEUMÉE 4498, Sept. 1919 (B); Banjoemas, hills between Banjoemas and Mandirantjang, KIEVITS, Banj. 108, Oct. 1923 (Pa); Semarang, sugar factory Tandjong Modjo, KRIMAN 11 and 15, June 1924 (Pa); Bandoengan, on shrubs, KOOPER 802, Sept. 1932 (B); Daroejana, teak-wood, 100 m, BACKER 16435, Sept. 1914 (B); Weleri, thickets, frequent, 5 m, BACKER 16512, Sept. 1914 (B); Kedoeng djati, virgin forest, KOORDERS 25054 $\beta$ , Sept. 1896 (B, L); id., KOORDERS 28093 $\beta$ , June 1897 (B, L); Oengaran, N. slope, virgin forest, 3—5000 ft, JUNGHUHN s.n. (L); Djapara-Rembang, Ngarengan, teak-wood, 50 m, KOORDERS 35612 $\beta$ , May 1899 (B); id., KOORDERS 35619 $\beta$ , May 1899 (B); Madioen, Madioen, hedge, 60 m, WISSE 23, Sept. 1918 (B); E. of Madioen, bank of dry river, 90 m, WISSE 680, Aug. 1921 (B); Kediri, forestry Krondong, teak-wood, 125 m, GRUTTERINK 3082, July 1918 (B); id., 150 m, DEN BERGER 412, Aug. 1918 (B); G. Pandan, THORENAAR 166, Sept. 1919 (B); Soerabaja, Soerabaja, DORGELO 2094, Sept. 1923 (Pa); Ma-



lang, Djatirata, grasslands, c. 25 m, BACKER 7877, May 1919 (B); Tengger, 400 m, BUYSMAN 205 and 209, Aug. 1907 (U); Besoeki, Djember, c. 85 m, ULTÉE 8 (B); G. Idjen, N. slope, above Bajeman, thickets, 500 m, BACKER 24972, June 1918 (B); between Pantjoer and Pradjekan, volcanic, very dry soil, 300 m, KOORDERS 32411 $\beta$ , Dec. 1898 (B); Poeger, KOORDERS 20930 $\beta$ , Oct. 1895 (B, L); id., KOORDERS 21457 $\beta$ , Oct. 1895 (B); id., virgin forest Sading, 10 m, KOORDERS 21080 $\beta$ , Oct. 1895 (B); Madoera, Kangean-islands, Kangean, Kaë, DOMMERS 78, Sept. 1919 (B).

BORNEO, without precise locality, KOORDERS 126 (L); BARBEY 396 (K); W. division, Sanggau, HALLER 930 (B, L); Sintang, TEYSMANN 8296 and 8297 (B); Benkajang, frequent, DUNSELMAN 45, July 1936 (B); S. and E. division, Bandjermasin, MOTLEY 231 and 546bis (K); Doesoen, KORTHALS 230 (L); West Koetai near Lahoen, thin second. forest, 15—20 m, ENDEET 1765, June 1925 (B); Hayoep, WINKLER 3381, Sept. 1908 (B, BD, K, L); Pagat, GRABOWSKY s.n. (BD); Long Sele, SCHLECHTER 13529, Aug. 1901 (BD); Sarawak, Kuching, SAHIB s.n. (S); Perkulu Ampat, Sarawak River, HAVILAND b.p.r.m., June 1890 (K, S); Baram district, Baram, HOSE 219, Oct. 1894 (K); Upper Baram, Lio Matu, MOULTON, Singapore Field n. 6716 (B, K, S); Brooketon, HAVILAND 1449, e.e.c. (K).

CELEBES, Celebes and Dependencies, Sirondjong near Lombasang, 900 m, BÜNNEMEYER 11559, May 1921 (B, L); Boeloe Parigi near Tanette, wayside, 560 m, BÜNNEMEYER 12476, June 1921 (B, L); Tjampaga, RACHMAT 161, exped. VAN VUUREN, July 1913 (B); Tawanga, Sangona, KJELLBERG 976, March 1929 (B); Kendari, KJELLBERG 550, Febr. 1929 (B); Kabaëna isl., Balo, Eempoehoe, 0—200 m, ELBERT 3325, Oct. 1909 (L); Manado, according to HALLER, 1898, in young thin forest; Manado, KOORDERS 16545 $\beta$ , Apr. 1895 (B, L); Sonder, young forest, 600 m, KOORDERS 16544 $\beta$ , May 1895 (B, BD, L); Amoerang, KOORDERS 16546 $\beta$ , March 1895 (B); Tonsawang, KOORDERS 16547 $\beta$ , March 1895 (B); between Manado and Tomohon, rather frequent, 300 m, KOORDERS 16548 $\beta$ , Jan. 1895 (B, BD, K, L); Manado, way to Bocha, KOORDERS 16549 $\beta$ , Jan. 1895 (B, L).

FLORES, Sita, edge of mountain forest, frequent, 600—800 m, Mrs. RENSCH 1373, June 1927 (BD); Mborong, thickets, 100 m, DE VOOGD 2833, Sept. 1936 (B).

TIMOR, without precise locality, ZIPPELIUS 33/b, named *Convolvulus tomentellus* ZIPP. (L); id., without collector's name (L).

WETAR, S. coast, Ilmedo, *Eucalyptus-savannah*, 0—50 m, ELBERT 4688, March 1910 (L).

MOLUCCAS, Ternate, Foramadiati, thickets, c. 400 m, BEGUIN 1115, Nov. 1920 (B); Boeroe, Kajeli, BOERLAGE 558, Aug. 1900 (B); Cera m, P. Boano, KORNASSI 1309, May 1918 (B); W. Ceram, Loki, coast vegetation, KORNASSI 1197, May 1918 (B); Wai Riocapa, 50 m, RUTTEN 1611, Sept. 1918 (B, L, U); N.W. Ceram, Wai Kapoetih, virgin forest, RUTTEN 1752, Oct. 1918 (B); S. Ceram, Amahai, TREUB s.n. (B); Ceram la oet, (according to WARBURG, 1891); Amboina, TEYSMANN s.n. (B); ROBINSON, Pl. Rumph. Amboin. 404, July-Nov. 1913 (B, L); Alang, BOERLAGE 512, July 1900 (B); Asiloeloe, BOERLAGE 353, July 1900 (B); G. Nona, BOERLAGE 110, July 1900 (B); Soja di bawa, TREUB s.n. (B); Hila, TREUB s.n. (B); Koeboeran Tjenkeh near Batoemerah, RANT 801, Nov. 1931 (B); Kampong Ema, 200—400 m, KORNASSI 1141, Apr. 1918 (B, L); Kai-islands, JAHRI 306 (B); Timor-laoet, RIEDEL s.n. (K).

NEW GUINEA, Territory of New Guinea, MAILANDER 26, Sept. 1913 (BD); Bismarck Mountains, Ramu River, RODATZ & KLINK 234, July 1899 (BD); id.,

alang fields, 180 m, LAUTERBACH 2730, Sept. 1896 (BD); Erima, near Stephansort, beach, LEWANDOWSKY 13, Aug. 1899 (BD, L); Sepik River, Malu, LEDERMANN 7958, July 1912 (BD); Papua, Koitaki, open savannah land, climbing up grasses, etc., c. 1500 ft, CARR 12850, July 1935 (L); Lake Daviumbu, Middle Fly River, in second. growth rain-forest, common, BRASS 7720, Sept. 1936 (L); id., rain-forest clearings, common, BRASS 7729, Sept. 1936 (L).

BISMARCK ARCHIPELAGO, New Britain (N. Pommern), Gazelle Peninsula, LAUTERBACH 291, May 1890 (according to SCHUMANN & LAUTERBACH).

PHILIPPINE ISLANDS, according to MERRILL throughout the Philippines in thickets at low and medium altitudes, usually common. Luzon, Central Luzon, LOHER 4133 (K); prov. Benguet, Baguio, ELMER 8920, March 1907 (B, K, L); prov. Isabela, San Mariano, RAMOS and EDAÑO, Bur. of Sc. 46901, Febr.-March 1926 (S); prov. Nueva Vizcaya, vicinity of Dupax, MCGREGOR, Bur. of Sc. 11398, March-Apr. 1912 (L); prov. Rizal, Manila, PERROTET s.n. (L); id., VIDAL 3343, March 1886 (K); id., MERRILL 2048, Dec. 1913 (B, BD, L, S); id., MERRILL 7403, Nov.-Dec. 1910 (L); id., ROBERTUS s.n. (BD); Antipolo, MERRILL 93, Jan. 1910 (U); Montalban, LOHER 4131, Febr. 1891 (K); San Francisco del Monte, LOHER 4132, Febr. 1891 (K); San Mateo, VIDAL 477, Oct. 1883 (K, L); Novaliches, Rio Tangeo, LOHER 4130, Febr. 1891 (K); Culion, open dry soil, MERRILL 447, Dec. 1902 (BD, K); Palawan, Brooks Point, Addison Peak, ELMER 12603, Febr. 1911 (B, BD, K, L, U); Isl. of Paragua, Point Separation, in open thickets, MERRILL 827, Febr. 1903 (BD, K).

Distribution: Tropical East Africa, Seychelles, British India, Ceylon, eastwards to China and Indo-China, Malay Peninsula, Malay Archipelago, Philippines, New Guinea and Queensland; the var. *occidentalis* HALL. f. in America from Mexico to Paraguay, West India, tropical West Africa.

Vernacular names: akar bungah koning (Mal. Peninsula, Selangor, GOODENOUGH); akar lakoon (Mal. Peninsula, Selangor, Fox); akar liha patong, akar ulan bitina (Mal. Peninsula, Malacca, ALVINS); akar kalimpanan, akar mantjie (Sumatra, DIEPENHORST?); andoer nasi (Mal.: Tobabatak, Sumatra, LÖRZING); oebi-oebi (Sumatra, W. coast, DIEPENHORST); akar bocloe (Sumatra, W. coast, BÜNNEMEYER); akar slemang (Sumatra, Palembang, PRAETORIUS); bajoe selocang, akar selocang (Sumatra, Palembang, BAL); akabocloe, akar itang (Sumatra, Djambi, POSTHUMUS); akar biabak (Bangka, BÜNNEMEYER); areuj kidang (Sund.: Java, BACKER, HEYNE); areuj reteu, areuj reuteun (Sund.: Java, Bantam, KOORDERS); ojed kedangan, ojet kidangan (Mal.: Java, Buitenzorg, KOORDERS); areuj jcuteum (Sund.: Java, Buitenzorg, BAKHUIZEN VAN DEN BRINK); tatapajan (Sund.: Java, Buitenzorg, RAAP); areuj geureung (Sund.: Buitenzorg, BACKER, KOORDERS); areuj bocloe (Java, Buitenzorg, BOERLAGE); kotong?, tamparkidang? (Jav.: Java, Djapara-Rembang, KOORDERS); lawatan kebo (Jav.: Java, Kediri, THORENAAR); waroengan (Jav.: Java, Besoeki, KOORDERS); rabet saobi

sabbian (Kangean-islands, DOMMERS); akar endit (Borneo, Koetai-language, ENDERT); ampas-ampas (Celebes, Makassar, MIQUEL); pala parang (Celebes, HEYNE, RACHMAT); rongo (Celebes, HEYNE), oewi-im-pager (Celebes, Tontemboan language, KOORDERS); katama (Celebes, Tomboeloe-language, KOORDERS); timbohoe koesoe (Celebes, Bantik language, KOORDERS); petatas octan (Ambon, KORNASSI); daoen bisoel, daoen bissol (Moluccas, MIQUEL); maboka (New Guinea, Terr. of N. Guinea, MAILANDER); bangbañgau (Philipp.: Ilóko language, MERRILL); kalamitmit (Philipp.: Tagbanúa language, MERRILL); kamokamotíhan (Philipp.: Pampáangan language, Tagalog language, MERRILL); malakamóte (Philipp.: Pampáangan language, MERRILL); tukod-tukod (Philipp.: Panay Bisáya language, MERRILL).

Use: See HEYNE, Nutt. Pl. ed. 2 (1927) p. 1301.

Remarks. 1. The specimens from Malaysia belong to var. *orientalis* HALL. f., with the exception of one or two sheets, representing var. *occidentalis* HALL. f. (a specimen from Depok (Buitenzorg), KOORDERS 31153  $\beta$ ; a specimen from Prinseneiland, KEULEMANS s.n.). HALLIER (1894) writes about the two varieties as follows: "von der indischen Form unterscheidet sich die amerikanische nur durch üppigeren Wuchs, grössere, breitere und typisch herzförmige Blätter, reichere und länger gestielte Blütenstände und angeblich gelbe Blüten". In 1896 (in Bull. Soc. Roy. Bot. Belgique XXXV, 1896, p. 270) he again gives the differences between the two varieties and here the description of var. *occidentalis* reads: "Tota planta robustior quam var.  $\beta$  orientalis HALLIER f. (*Ip. cymosa* R. et SCH.), glabrescens, laetius viridis; caulis senior lignescens; folia majora et longiora quam in var.  $\beta$  orientali, longe cordiformia, forma Calystegiam imitantia, basi profundius angustiusque sinuata, lobis basalibus oblongis, saepe subsagittatis, adulta utrinque glabra, nitidula, laetius viridia; flores subumbellati; pedunculi glabrescentes; pedicelli glabri, fere una ex pedunculi apice nati; alabastra et corollae multo majores quam in var.  $\beta$  orientalis speciminibus in Archipelago Malayo-Papuario collectis (sed non omnibus ex India anglica); sepala glabra; corolla saturate sulfurea; corollae fasciae 5 mesopetalae extus apice pilis minutissimis vix conspicuis sparse obsiti. In speciminibus validioribus petioli ultra 3 dm. longi, folii lamina usque 2 dm. longa et 17 cm. lata."

Moreover, the American specimens have, as far as I can see the capsule subglobose instead of ovoid to conical with broader, ovate valves and the seeds not so long villose, but pubescent to short tomentose and only with slightly longer hairs at the margin (such seeds are found

in the Leiden Herbarium in the specimens MERCEDES CHANEK 130 and 131, from British Honduras, El Cayo and vicinity, March-June 1933). See fig. 1, r. According to the description in my paper on the Convolvulaceae of Surinam (in PULLE, Flora of Surinam, IV, p. 81), the seeds of the Surinam specimens are softly pubescent. In MARTIUS's Flora Brasiliensis the capsule is described as subglobose and the seeds as "fusco-velutina, margine breviter villosa". The sepals of the American materials are usually longer than is found in the Malaysian specimens, they have a length of 7—10 mm, whereas in Malaysia they are 5—7, sometimes to 8 mm long. The colour of the flower of American specimens is yellow; the majority of the specimens in the eastern part of Malaysia has white flowers, completely or partly yellow ones are, however, not rare in the western part of the region. According to some label-notes the corolla is yellow, dull orange-yellow, pale yellow, salmon yellow, rarely white (Malay Peninsula), cream, pale yellow (Atjeh), yellow, bright yellow, whitish with yellow throat or white (E. coast of Sumatra), white to pale orange, pale orange, pale orange-yellow or white (W. coast of Sumatra), white (Nias), white (Benkoelen); yellow (Djambi); white (Bangka), white (the majority of the specimens from Java, with exception of some numbers collected near Buitenzorg, with pale yellow or whitish yellow flowers), white with yellow centre (W. Borneo, S. and E. Borneo), white (Sarawak, N. Borneo); white (Celebes, Moluccas, Lesser Sunda Islands, New Guinea, Philippines).

In *Merremia peltata* (L.) MERRILL we have a remarkable parallelism to this species as to the colour of the corolla, for in that species the majority of the specimens in the western part of Malaysia has yellow flowers (Malay Peninsula; Sumatra, with exception of a specimen from Simaloer; Java, Borneo, with exception of some specimens from British North Borneo; Celebes) whereas in the Moluccas, New Guinea and more eastwards the corolla seems to be constantly white.

2. The specimen KOORDERS 31153  $\beta$  from Depok (Buitenzorg, Java) has subglobose 4-valved capsules, c. 15 mm in diam. with broad ovate valves; the seeds are 6 mm long, densely tomentose, with slightly longer hairs at the margin (perhaps belonging to var. *occidentalis*).

#### Section 4. *Hailale* HALL. f.

HALL. f. in ENGL., Bot. Jahrb. XLIX (1913) p. 379.

Closely related to section *Xanthips*; flower-buds ovoid or narrow-ovoid, acute or acutish, rarely subglobular, the midpetaline bands of the corolla not with distinct dark lines; inflorescences corymbose, often

forming terminal panicles, the lower bracts often foliaceous; flowers of moderate size or large. Generally large woody climbers.

**13. *Merremia Boisiana*** (GAGNEP.) VAN OOSTSTR., nov. comb. — *Ipomoea Boisiana* GAGNEP. in Notul. System. III (1914) p. 141; GAGNEP. et COURCH. in LEC., Fl. Indo-Chine, IV (1915) p. 263<sup>1)</sup>.

A large woody climber, the branches terete or slightly striate, fistulose, glabrous, dark greyish brown or brownish-black, to 5 mm in diam. in the type specimen, the leaves petiolate, petiole glabrous or very sparsely pubescent near the top, to 7 cm long, blade broad-ovate to orbicular, acuminate to cuspidate at the apex, broadly cordate at the base, 8—14 cm long, 7—12 cm broad, quite glabrous, paler beneath than above, in the type glaucous beneath, midrib and 8—9 pairs of lateral nerves prominent beneath, slightly impressed above, secondary nerves parallel, prominulous beneath, slightly impressed above, tertiary nervation finely reticulate, prominulous above. Inflorescences axillary, 12—21 cm long, corymbosely ramified at the apex, several-flowered, the peduncle terete in the basal part and glabrous, more or less applanate above and pubescent, 9—13 cm long; the branches slightly pubescent, the lower ones 4—2.5 cm long; bracts minute, narrow-triangular, 1—1.5 mm long, deciduous, or the lower ones sometimes foliaceous; pedicels to 8(—12) mm long, sparsely pubescent, slightly thickened towards the calyx; the flower-buds subglobular. Sepals subequal in length or the outer ones slightly shorter, 5—7 mm long, concave, glabrous or the exterior ones slightly pubescent especially near the base, the exterior ones orbicular or transverse elliptic, broadly obtuse or slightly retuse at the apex, the interior ones broadly transverse elliptic; the corolla yellow (Bois), broadly funnel-shaped to campanulate, circ. 22 mm long, the limb hardly lobed, the midpetaline bands densely sericeous outside; filaments inserted about 3—3.5 mm above the corolla base, 3—5 mm long, curved at the dilated, papillose base; the corolla with two longitudinal hair lines below the place of insertion of each filament; anthers straight, later on spirally twisted; disk small; ovary conical, glabrous, style about 9—10 mm long, glabrous, stigmas globular, papillose. Capsule (according to GAGNEPAIN) glabrous, 4-valved, ovate-conical, castaneous at the base, yellow upwards.

SUMATRA, East Coast, without precise locality, YATES 975 (K).

<sup>1)</sup> A related species is *Merremia Bimbim* (GAGNEP.) VAN OOSTSTR., nov. comb. (*Ipomoea Bimbim* GAGNEP. in Notul. System. III (1914) p. 140; GAGNEP. et COURCH. in LEC., Fl. Indo-Chine IV (1915) p. 247) Type: BON 2700, Tonkin, prov. Hanoï, near Vo-xa (P).

**Distribution:** Indo-China, Sumatra.

**Remarks.** The specimen collected by YATES in Sumatra is almost entirely identical with the type of *Ipomoea Boissiana* GAGNEP. from Tonkin (Bois 138) in the Paris herbarium. Only the lower surface of the leaves of the Tonkin specimen is somewhat more glaucous than in that from Sumatra. The specimen BECCARI 3594 from Borneo, mentioned by GAGNEPAIN under *Ipomoea Boissiana* most probably belongs to *Merremia crassinervia* VAN OOSTSTR.

var. *fulvopilosa* (GAGNEP.) VAN OOSTSTR. — *Ipomoea Boissiana* GAGNEP. var. *fulvopilosa* GAGNEP. in Notul. System. III (1914) p. 142 — *I. Boissiana* GAGNEP. var. *rufopilosa* GAGNEP. in LEC., Fl. Indo-Chine IV (1915) p. 263.

The stems, the peduncles and their branches, the petioles and the lower surface of the leaves densely rufous pilose to tomentose; the upper surface of the leaves is more sparsely pilose; the pedicels are rufous pilose in the basal part, for the rest glabrous, the sepals are glabrous, except some hairs near the base; the corolla has the same densely sericeous midpetaline bands as the typical form of the species. The branches of the inflorescences are shorter than in the typical form and are more crowded.

**Type:** BON 4801, Tonkin, region of Lac-thô.

**Distribution:** Tonkin.

var. *sumatrana* VAN OOSTSTR., nov. var.

Differt ramis, pedunculis petiolisque cinereo vel fulvo pubescentibus, glabrescentibus, foliis subtus dense griseo-pubescentibus, pallidioribus, supra primo dense, deinde sparse pubescentibus, glabrescentibus; pedicellis cinereo- vel fulvo-pubescentibus, sepalis glabris vel exterioribus basin versus subpubescentibus.

SUMATRA, East Coast, Sibolangit, nature reserve, common in thickets and in young, rarely in old forest, c. 500 m, LÖRZING 4723, Febr. 1917 (B; L, *type*); S. of Sibolangit, common in young forests and thickets, c. 600 m, LÖRZING 4234, Febr. 1916 (B).

**Distribution:** Sumatra.

**Remarks.** 1. According to the field notes the specimens collected by LÖRZING are large woody climbers, to 20 m high, covering whole trees. The nerves of the leaves and the petioles are reddish or reddish brown; the flowers are white. An old branch on the type sheet in Leiden with the fruits fallen off, has still persisting calyces; they are slightly enlarged.

2. This variety differs from typical *Merremia Boissiana* by the characteristics given above. It much resembles var. *fulvopilosa* GAGNEP.;

the indument is, however, of a different kind; in var. *fulvopilosa* the hairs are much longer, and rufous (rather than fulvous), whereas in the new variety they are much shorter, less dense and more greyish. In the specimen LÖRZING 4234 the larger leaves have a length of 20 cm and a width of 16 cm with a petiole of 10 cm; the inflorescence have a length of 8–16 cm.

**14. *Merremia mammosa* (LOUR.) HALL. f.** in *Teysmannia* VII (1897) p. 164; id. in *Versl. 's Lands Pl. t.* 1895 (1896) p. 127; BOERL., *Handl. Fl. Ned. Ind.* II (1899) p. 509; KOORDERS, *Exk. fl. Java* III (1912) p. 113; KOORD.-SCHUM., *Syst. Verz.* (1910–13), *Conv.* p. 3; HEYNE, *Nutt. Pl. ed. 2* (1927) p. 1299; KOOLHAAS in *Ann. Jard. Bot. Buitenz.* XLV (1938) p. 182 — *Convolvulus mammosus* LOUR., *Fl. Cochinch.* I (1790) p. 108 — *Ipomoea mammosa* (LOUR.) CHOISY in *Mém. Soc. Phys. Genève* VI (1833) p. 475; id. in DC., *Prodr.* IX (1845) p. 389; MIQ., *Fl. Ned. Ind.* II (1857) p. 620; VORDERMAN in *Tijdschr. Inl. Geneesk.* IV, 1 (1896) p. 4; COSTERUS and SMITH in *Ann. Jard. Bot. Buitenz.* XIX (1904) p. 159, pl. XXIII, fig. 67 (teratology) — *I. Gomezii* CLARKE in HOOK., *Fl. Brit. Ind.* IV (1883) p. 211 (according to HALLIER).

Subterraneous parts tuberous, tubers fusiform, fasciculate, 6–7 together, c. 25 cm long, with white milky juice; stems annual, twining, quite glabrous as is the whole plant, terete, brown, finely striate in the older parts, to 5 mm in diam. Leaves petiolate, petiole slender, to 6, sometimes to 10 cm or more long; blade broad-ovate to orbicular or sometimes broader than long, abruptly acuminate with narrow, obtuse, mucronulate acumen, the base cordate with a more or less deep, broad sinus, the margin entire or somewhat undulate; length of blade 6–12 cm, width 4.5–12 cm, sometimes to 15 cm; lateral nerves 7–9 pairs, 3 or 4 pairs of them from near the base; secondary nerves many, parallel; tertiary nervation reticulate. Inflorescences axillary, the peduncle terete or slightly angular above, from 3 to 15 cm long, with 1–3, sometimes with more flowers; pedicels thickened and angular above, 12–15 mm long, bracts linear-lanceolate or lanceolate, membranous, 7–10 mm, caducous. Flower-buds narrow-ovoid, acute. Sepals large, concave, the 3 exterior ones broad-ovate to broad-elliptic, obtuse, minutely mucronate, the inner ones narrower and less obtuse, all of about the same length, 24–30 mm long. Corolla white, 7–8 cm long, broadly funnel-shaped, contracted at the base into a short tube; the limb glabrous but with minute punctiform glands outside; midpetaline bands distinctly veined. Filaments 7–8 mm long, inserted about 10 mm

above the corolla base, the base of the filaments decurrent with a row of hairs on each side; anthers spirally twisted. Disk annular. Ovary glabrous; style glabrous, c. 20 mm long, with 2 free globular stigmas. Capsule enclosed by the persistent calyx. Seeds 8 mm long, greyish to black with long brownish hairs along the margins, hairs to 8 mm long.

JAVA, Batavia, Laanhof, S.W. of Weltevreden, cultivated in native garden, BACKER 33473, April 1904 (B, L, U); Buitenzorg, cultivated in the Botanic Garden at Buitenzorg n. XV. H 13, 38 and 38A (according to HALLIER, 1896); id., HALLIER 164a and c, May 1895 (L); Batoetoelis, cultivated, KOORDERS 40296  $\beta$ , Aug. 1910 (B); Tjigombong, cultivated, KOORDERS 44053  $\beta$ , July 1900 (B); Pekalongan, sugar factory Tirta, DOCTERS VAN LEEUWEN s.n., Apr. 1911 (B); Madoera, hills S.W. of Rapa, spontaneous, 150 m, BACKER 20249, March 1915 (B).

Distribution: British India, Indo-China, Andamans, Philippine Islands (?); cultivated in Java, especially in the Principalities (VORDERMAN), but also in other parts of the island, formerly also in Bali and in the Moluccas (according to RUMPHIUS; see Remarks); probably occasionally escaped from culture (Madoera?).

Vernacular names: bidara oepas (Mal., KOORDERS, HEYNE, VORDERMAN); widara oepas (Jav., KOORDERS, TEYSMANN, VORDERMAN); wirodjo (Jav., KOORDERS); blamar (Jav., HEYNE); oebi soefoe (Moluccas, MIQUEL, TEYSMANN); bangkoewang, bangcoan (Bali, RUMPHIUS); haylale, hailale (Ambon, RUMPHIUS, HEYNE); angcoa (Philippines, RUMPHIUS).

Use: Used as a native anti-diabetes remedy; also used in affections of the throat and the respiratory organs (HEYNE l.c.) or in cases of lung tuberculosis (VORDERMAN). The tubers are edible.

Remarks: 1. *Merremia mammosa* has been based by HALLIER on *Convolvulus mammosus* LOUR., most probably only on account of LOUREIRO's description. According to LOUREIRO his plant was cultivated in Cochinchina, under the name of Khoai tu. The description given by LOUREIRO is a very short one, but fairly well agrees with the specimens cultivated in Java, which HALLIER named *Merremia mammosa*. As it is impossible to find out what LOUREIRO really understood under his *C. mammosus*, we provisionally accept HALLIER's name for the species described above. LOUREIRO gives *Batatta Mammosa* RUMPH. as a synonym, and it is evident that he based his name on that given by RUMPHIUS. RUMPHIUS (Herb. Amb. V (1747) p. 370, t. 131) gives an extensive description of the plant, accompanied by a plate. The species is described as a cultivated one, introduced from the Philippines, especially from Mindanao, by the Pampangan people. MERRILL in his "An Interpretation of RUMPHIUS's Herbarium Amboinense", 1917, p. 442—443, gives as his opinion that *Batatta mammosa* of RUMPHIUS is ap-



parently a composite species, consisting of the stem, leaves and flowers of a Convolvulaceous plant while the tubers are most probably of a *Dioscorea*. The Convolvulaceous plant should be identic with *Operculina Turpethum* (L.) S. MANSO, the only species, as MERRILL says, known from Amboina, which fairly well agrees with RUMPHIUS's plant. It is, indeed, possible that RUMPHIUS meant this species, but with as great a probability we can say that RUMPHIUS's plant was *Merremia mammosa*. MERRILL did not know *Merremia mammosa* from Amboina when writing his publication; he did not even know this species at all. Nor did he most probably know specimens of *Operculina Turpethum* from Amboina. Moreover, RUMPHIUS informs us extensively about the use of his species; *Operculina Turpethum* is as far as I know not used in the Malay Archipelago, neither as a food plant nor as a plant of medicinal use, whereas *Merremia mammosa* played and still plays an important role in native medicine and was at least formerly also eaten. About its Philippine origin I must state that I did not see any materials from these islands. It is, of course, possible that it was cultivated there too in RUMPHIUS's time.

The specimens mentioned above are all cultivated ones with the exception of that from Madoera, where it was collected among bushes in the hills S.W. of Rapa (escaped from culture?).

2. COSTERUS and SMITH l.c. describe and give a figure of a monstrosity of a leaf, a terminal ascidium.

15. *Merremia borneensis* MERRILL in Univ. Calif. Publ. Bot. XV (1929) p. 260.

A large woody climber, quite glabrous, the stems to about 2 cm in diam. (MERRILL), the branches 3—7 mm, terete, fistulose, pale brown to dark brown, warty by pale lenticels. Leaves chartaceous, in dried state dark brown above, paler beneath, opaque above or shining, orbicular, cuspidate with a long and narrow, mucronulate acumen, cordate at the base, 8—22 cm long, 6—18 cm broad, quite glabrous on both sides; midrib prominent beneath, side-nerves curved, prominent beneath, 8—11 on each side, secondary nerves parallel, prominent beneath, tertiary nerves conspicuous, reticulate; petiole black in dried state, striate, 4—11 cm long. Inflorescences several-flowered, 10—25 cm long (MERRILL); peduncles axillary, 6—12 cm long, lenticellate, cymosely branched towards the apex; bracts deciduous; pedicels 1.5—3 cm long, thickened above, especially in fruit, angular. Flower-buds ovoid to oblong, acute. Sepals brown in dried state, elliptic to broad-elliptic, obtuse to slightly emarginate, minutely mucronate, 18—22 mm long, the two outer ones leathery,

the inner ones thinner and more or less membranous, all persistent and slightly accrescent in fruit. Corolla yellow, 5.5—6 cm long, campanulate to funnel-shaped, slightly lobed, glabrous outside, inside papillose below the place of insertion of the filaments. Filaments glabrous, to about 2 cm long, inserted about 14 mm above the corolla base. Above the place of insertion of the filaments the corolla has a semicircular thickening inside. Ovary ovoid, glabrous, 4-celled; style filiform, about 3 cm long (MERRILL); capsule ovoid, mucronate, glabrous, black, "about 12 mm high" (MERRILL); seeds oblong-ovoid, pale, appressed pilose, about 6—7 mm long.

BORNEO, W. division, Kapoeas, Singtang, TEYSMANN 8298 (B); British North Borneo, without precise locality, CREAGH s.n. (K); Elphinstone Prov., Tawao, ELMER 20990, *type*, fruiting specimen, Oct. 1922—March 1923 (B, BD, K, P, S, U); Myburgh Prov., Sandakan, ELMER 20260, flowering specimen, Oct.-Dec. 1921 (B, BD, K, L, S, U); according to MERRILL scandent and forming tangled masses over thickets, especially along small streams. Moreover, MERRILL mentions the specimens Mrs. CLEMENS 11170, from Mount Kalawat, D. D. WOOD 769 and AGAMA 487, from the vicinity of Sandakan as to represent the same species. I am not sure that MERRILL's identification of the specimens WOOD 769 and AGAMA 487 is right. The specimens indeed resemble *M. borneensis*; the flowers are, however, too young for a sufficiently accurate examination.

Distribution: Borneo.

Remarks. The specimens TEYSMANN 8298 and CREAGH s.n. have smaller, 5—9 cm long, 3.5—7 cm broad, ovate leaves with an acuminate and not so distinctly cuspidate apex as is found in the specimens of ELMER.

16. *Merremia pulchra* VAN OOSTSTR., nov. spec. Fig. 3, a—c.

Frutex verisimiliter scandens, glaberrimus, ramis teretibus, griseo-brunneis, sparse pallide lenticellatis, ad 3 mm diam., foliis petiolatis, petiolo supra longitudinaliter sulcato, 2—2.5 cm longo, ovatis, apice subabrupte acuminatis, acumine c. 1 cm longo, acuto, basi cordatis, 9—11 cm longis, 5.5—6.5 cm latis, nervo mediano nervis primariis utrinque 6—7 supra subimpressis, subtus prominentibus, nervis secundariis plusminusve parallelis, supra paullo prominulis, subtus planis, nervis tertiariis indistincte reticulatis; inflorescentiis axillaribus c. 20 cm longis, racemoso-ramosis, pedunculo nudo c. 6 cm longo, terete, ramis paucis tenuibus, inferioribus 7 cm, superioribus 5—2.5 cm longis, unifloris, pedicellis apicem versus angulatis et incrassatis, 1.5—2.5 cm longis; sepalis tenuiter coriaceis vel interioribus membranaceis, subaequilongis vel exterioribus paullo brevioribus, 25—28 mm longis, vel interioribus ad 30 mm longis, oblongis vel elliptico-oblongis, apice obtusis, minutissime mucronatis, corolla lutea, late infundibuliforme, c. 6 cm longa, glabra.

BORNEO, Sarawak, Muara Brunei bay, P. K. GNS (†) 14, April 1896 (S).

Distribution: Borneo.

Remarks. 1. "A fine yellow *Convolvulus*, very common in Borneo" (this remark on the label is presumably due to an interchange with the common *M. peltata*).

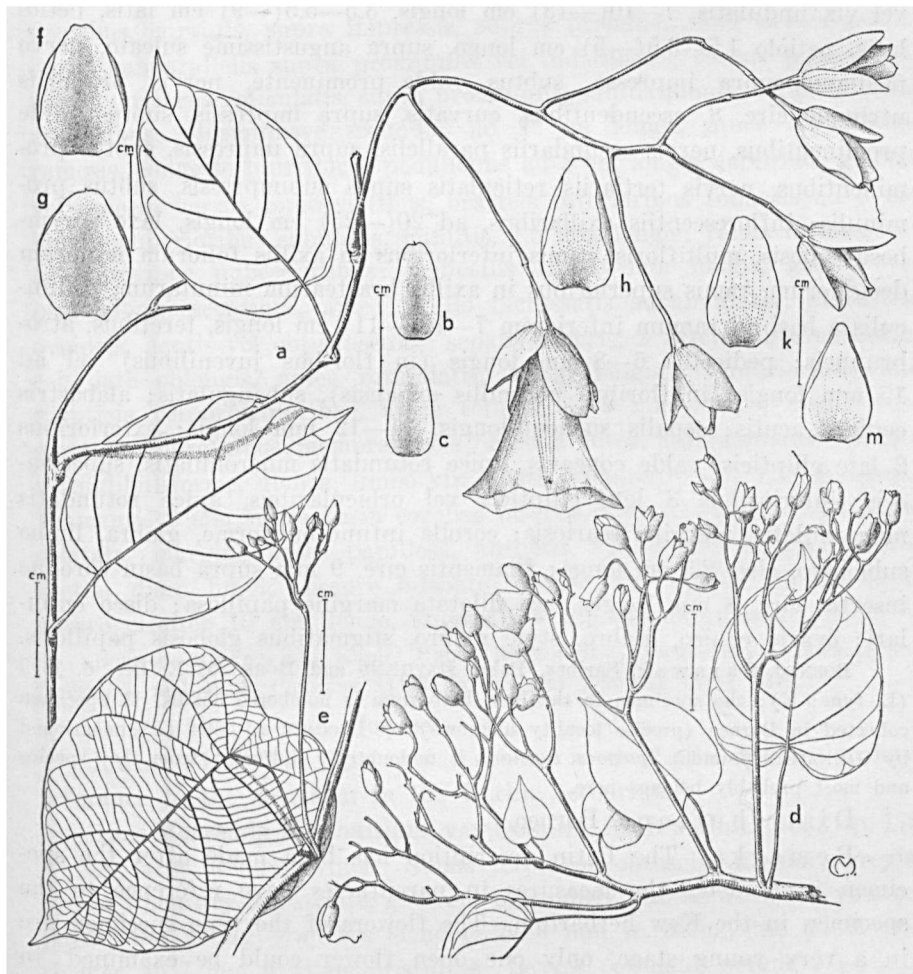


Fig. 3, a: *Merremia pulchra* VAN OOSTSTR., branch of the type (S); b—c: *id.*: two outer sepals; d—e: *M. Elmeri* MERRILL var. *glaberrima* VAN OOSTSTR., branches of the type (L); f—m: *id.*, sepals 1—5.

2. The type specimen possesses only one open flower, glued upon the sheet, of which I could not examine the interior parts. The species is, however, sufficiently characterized by the description given above.

**17. *Merremia crassinervia* VAN OOSTSTR., nov. spec. Fig. 1, a.**

Frutex scandens, glaberrimus, ramis teretibus, lenticellis pallidis verrucosis, cinereo-brunneis, ad 3.5(—4) mm crassis, solidis vel fistulosis; foliis ovatis (vel late ovatis) apicem versus attenuatis vel subacuminatis, apice obtuso vel subacuto, basi cordatis, margine integerrimis vel vix undulatis, 7—10(—13) cm longis, 3.5—5.5(—9) cm latis, petiolatis, petiolo 1.5—3.5(—5) cm longo, supra angustissime sulcato, nervo mediano supra impresso, subtus valde prominente, nervis primariis utrinque circ. 8, ascendentibus, curvatis, supra impressis, subtus valde prominentibus, nervis secundariis parallelis, supra impressis, subtus prominentibus, nervis tertiariis reticulatis supra subimpressis, subtus prominulis; inflorescentiis axillaribus, ad 20(—25) cm longis, laxe corymboso-ramosis, multifloris, ramis inferioribus in axillis foliorum minorum deciduorum, ramis superioribus in axillis bractearum minutarum, pedunculis a basi ad ramum inferiorem 7—10(—11) cm longis, teretibus, atrobunneis; pedicellis 6—8 mm longis (in floribus juvenilibus) vel ad 15 mm longis (in floribus nonnullis expansis), subangulatis; alabastris conicis, acutis; sepalis subaequilongis, 11—12 mm longis; exterioribus 2 late ellipticis, valde concavis, apice rotundatis mucronulatis, subcoriaceis, interioribus 3 late ellipticis vel orbicularibus, apice rotundatis mucronulatis, margine scariosis; corolla infundibuliforme, glabra, limbo sublobato, circ. 2.5 cm longa; filamentis circ. 9 mm supra basin corollae insertis, circ. 8 mm longis, basi dilatata margine papillosa; disco cupulari; ovario conico, glabro, stylo glabro, stigmatibus globosis papillosis.

BORNEO, Sarawak, Saribas, Paku, HAVILAND and HOSE 3523E, Dec. 6, 1893 (L, type; K); the specimen in the Kew herbarium is numbered 3523K. A specimen collected in Borneo (precise locality unknown) by BECCARI, n. 3594 (P), mentioned by GAGNEPAIN<sup>1)</sup> under *Ipomoea Boissiana* is undoubtedly different from that species and most probably belongs here.

**Distribution:** Borneo.

**Remarks.** The Latin description has been made after the specimen in Leiden; the measures in parentheses have reference to the specimen in the Kew herbarium. The flowers of the type specimen are in a very young stage, only one open flower could be examined, in which, however, the anthers were destroyed. The greater part of the flowers of the specimen in Kew is very young too, some others have already lost their corolla.

**18. *Merremia Clemensiana* VAN OOSTSTR., nov. spec. Fig. 1, d.**

Frutex scandens, ramis teretibus, glabris vel apicem versus pubescentibus.

<sup>1)</sup> GAGNEPAIN in Notul. System. III (1914) p. 141, 142.

tibus, leviter striatis, sub lente lenticellis pallidis minutissime verrucosis, ad 3.5(—5) mm diam.; foliis glabris ovatis (vel late ovatis) apicem versus gradatim attenuatis vel breviter acuminatis, apice obtusis mucronulatis, basi rotundatis, 5—9 cm longis, 3—5(—7) cm latis, petiolatis, petiolo 1—3 cm longo, glabro, supra anguste sulcato, nervo mediano supra impresso subtus prominente, nervis primariis utrinque 5—6, ascendentibus, curvatis, supra impressis, subtus prominentibus, nervis secundariis subparallelis supra prominulis vel indistinctis, subtus prominulis, nervis tertiariis reticulatis, supra prominulis, subtus planis, inflorescentiis axillaribus, plusminusve secundis, ad 12 cm longis, apice corymbosoramosis, congeste plurifloris, pedunculis ad 8 cm longis, teretibus, glabris vel apicem versus pubescentibus, bracteis inferioribus foliaceis ad 3 cm longis, superioribus subulatis, minutis, 1.5 mm longis; ramis inflorescentiae brevibus pubescentibus; pedicellis 12—16 mm longis, glabris vel basi subpubescentibus, apice paullo incrassatis subangulatis; alabastris ovoideis, acutis vel obtusiusculis; sepalis glabris, 2 exterioribus subcoriaceis late oblongis, apice rotundatis, 7 mm longis, 3 interioribus late ellipticis vel orbicularibus, apice retusis, 8—9 mm longis, medio subcoriaceo, marginibus membranaceis; corolla lutea, campanulata vel late infundibuliforme, glabra, limbo vix lobato, crenulato (?), 1.5 cm longa; filamentis 2 mm supra basin corollae insertis, 7 mm longis, basi curvata, dilatata, margine basin papillosa, antheris 2.5—3 mm longis, glabris, rectis; disco brevi, obscure 5-lobato; ovario late conico, glabro, stylo glabro circiter 10 mm longo, stigmatibus globosis papillosis.

BORNEO, Sarawak, Kapit, Upper Rejang River, scandent in thickets and forests, J. and M. S. CLEMENS 21133, in the year 1929 (B, *type*; BD).

**Distribution:** Borneo.

**Remarks.** The data in parentheses in the Latin description have reference to the specimen in the Berlin herbarium.

**19. *Merremia Korthalsiana* VAN OOSTSTR.** in Kew Bull. (1938) p. 175.

A large woody twiner. Stems terete or obtusely angular, greyish brown when dry, substrate, glabrous or slightly pubescent in the younger parts; the young branches slender, 2—3 mm in diam., the adult ones thicker, to 7 mm in diam., fistulose. Leaves petiolate, petiole 2.5—6 cm long, black when dry, substrate and slightly sulcate above, the groove with some very short hairs or glabrous; the blade chartaceous or thin-coriaceous, broad-ovate or orbicular, abruptly acuminate or cuspidate at the apex, the acumen narrow, acute and 1—1.5 cm long; broadly cordate or truncate at the base, 6—15 cm long and 4—14 cm broad, blackish above in dry specimens and glabrous, opaque or more or less shining,

palier beneath and there pubescent on the nerves or glabrous; the primary nerves 7—8(—10) on each side of the midrib, arcuate, often subimpressed above, prominent beneath, the secondary nerves subparallel, prominulous above, prominent beneath, the tertiary nerves reticulate, prominulous above. Inflorescences axillary, long pedunculate, corymbosely ramified at the apex, to 20 cm long, secund or often forming a more or less umbellike panicle at the end of the branches, the peduncle to 12 cm long, pubescent or glabrous, longitudinally striate; primary branches many, in the axils of foliaceous bracts, pubescent, 1.5—4 cm long, cymose at the apex with several flowers; upper bracts small, linear-subulate, pubescent, 2.5—4 mm long; pedicels pubescent, 12—20 mm long; flower-buds ovoid, acutish; sepals black when dry, shining, broad-elliptic or orbicular, broadly rounded at the apex and whether or not minutely mucronate, glabrous outside, and with many minute resinous dots inside, equal in length or the outer ones slightly shorter, 9—10 mm long; corolla yellow, broadly funnel-shaped or campanulate, 20—24 mm long, obscurely lobed, glabrous outside, inside with some hairs below and between the bases of the filaments; filaments inserted about 5 mm above the base of the corolla, about 10 mm long, papillose at the margins of the slightly broadened base; anthers straight, glabrous, 3—4 mm long; disk low, slightly 5-lobed; ovary conical, glabrous; style glabrous, 11—12 mm long; stigma biglobular, papillose.

BORNEO, W. division, Liang gagang, HALLIER 3006, March 1894 (B, L); S. and E. division, Doesoen, KORTHALS 237 (L, *type*); Soengei Bloe-oe, JAHERI 376 (exp. NIEUWENHUIS) (B); id., JAHERI 1055 (exp. NIEUWENHUIS) (B, mixed with *M. peltata* (L.) MERRILL); id., JAHERI 1098 (exp. NIEUWENHUIS) (B); Darat Mahakam, AMDJAH 38 (exp. NIEUWENHUIS), Oct. 1898 (B); Sarawak, Mount Dulit, under 300 m, a frequent species, chiefly or entirely in secondary forest, RICHARDS 2219, Oct. 1932 (K); Upper Baram, Lio Matu, 500 ft, MOULTON, Singapore Field n. 6721, Oct. 1920 (B, S).

Distribution: Borneo.

20. *Merremia peltata* (L.) MERRILL, Interpr. Rumph. Herb. Amb. (1917) p. 441; id., Enum. Philipp. Fl. Pl. III (1923) p. 362; HEYNE, Nutt. Pl. ed. 2 (1927) p. 1300 — *Convolvulus peltatus* L., Spec. Plant. (1753) p. 1194 — *Ipomoea nymphaefolia* BL., Bijdr. (1825) p. 719, non GRISEB.; PRIN in Journ. As. Soc. Bengal LXIII (1894) p. 107 — *I. peltata* (L.) CHOISY in Mém. Soc. Phys. Genève VI (1833) p. 452; id. in DC., Prodr. IX (1845) p. 359; ZOLL., Syst. Verz. 2. Heft (1854) p. 129; MIQ., Fl. Ned. Ind. II (1857) p. 605; id., Suppl. (1860) p. 235; BENTH., Fl. Austr. IV (1869) p. 418; F.-VILL., Novis App. (1880) p. 140 (not seen); VIDAL, Sinopsis Atlas (1883) p. 34, t. 71, fig. C (not seen); VON MUELLER, Descr. Notes Pap. Pl. VII (1886) p. 30; WARB. in ENGL.,

Bot. Jahrb. XIII (1891) p. 412; MANSON BAILEY, Queensl. Fl. IV (1901) p. 1059; MERRILL in Philipp. Bur. Forestr. Bull. I (1903) p. 50 (not seen); MANSON BAILEY, Compr. Cat. Queensl. Pl. (1909) p. 347; WHITE in Contrib. Arn. Arbor. IV (1933) p. 93 — *Spiranthera peltata* (L.) BOJ., Hort. Maurit. (1837) p. 226 (not seen) — ? *Chironia capsularis* BLANCO, Fl. Filip., ed. 1 (1837) p. 102 (doubtful); MERRILL in Bur. Gov. Lab. Philipp. 27 (1905) p. 63 — ? *C. lanosantha* BLANCO, Fl. Filip., ed. 2 (1845) p. 71 (not seen); id., Fl. Filip., ed. 3 (1877) p. 132, Ic. II, t. 261, f. 1 (doubtful); MERRILL in Bur. Gov. Lab. Philipp. 27 (1905) p. 63 — *Operculina peltata* (L.) HALL. f. in ENGL., Bot. Jahrb. XVI (1893) p. 549; id. in ENGL., Bot. Jahrb. XVIII (1894) p. 119; id. in Meded. 's Lands Pl. t. XIX (1898) p. 545; SCHUM.-LAUTERB., Fl. Deutsch. Schutzgeb. (1901) p. 517; KOORD.-SCHUM., Syst. Verz. III (1914) p. 110 — *Merremia nymphaeifolia* (BL.) HALL. f. in Versl. 's Lands Pl. t. 1895 (1896) p. 127; id. in Bull. Herb. Boiss. V (1897) p. 381; BOERL., Handl. Fl. Ned. Ind. II (1899) p. 510; HALL. f. in Bull. Herb. Boiss., sér. 2, I (1901) p. 675; PRAIN in Journ. As. Soc. Bengal LXXIV (1906) p. 305; MERRILL in Philipp. Journ. Sc. III (1908) p. 430; KOORDERS, Exk. fl. Java III (1912) p. 113; HALL. f. in ENGL., Bot. Jahrb. XLIX (1913) p. 379; KOORD.-SCHUM., Syst. Verz. (1910—13) Conv. p. 5; RENDLE in Journ. Linn. Soc. XLII (1914) p. 112; BOLDINGH, Zakfl. Java (1916) n. 832; MERRILL, Spec. Blanc. in Philipp. Bur. of Sc. Publ. 12 (1918) p. 325; id. in Journ. Roy. As. Soc. Str. Br. Spec. Numb. (1921) p. 509; RIDLEY, Fl. Malay Penins. II (1923) p. 458; RENDLE in Journ. Bot. LXIII, Suppl. (1925) p. 71; HEYNE, Nutt. Pl. ed. 2 (1927) p. 1300.

A large climber, covering whole trees, occasionally procumbent; the stems from a large subterraneous tuber, terete, fistulose or pithy, with milky juice, glabrous or with some fulvous hairs at the base of the petioles, brownish or brownish-black when dry, the thickest parts striate. Leaves peltate, broad-ovate to orbicular or even broader than long, with a rounded or slightly retuse base (the leaves of the inflorescences sometimes cordate at the base and not or indistinctly peltate), the apex acuminate or abruptly cuspidate, the acumen acute and mucronulate; surfaces glabrous or the lower surface slightly hairy along the nerves; primary nerves 7—10 on each side of the midrib; secondary nerves many, distinctly parallel, finer nervation reticulate; length and width of the blade 7—30 cm; petiole shorter or longer than the blade, 3—20 cm long or more, glabrous. Inflorescences to 40 cm long, widely corymbose; the peduncles axillary, solitary or two in a leaf axil, stout, terete; flowers several to many; bracts deciduous; pedicels 18—25 mm long, thickened

and angular above, clavate in fruiting stage and then to 50 mm long. Flower-buds narrow-ovoid, acute. Sepals large, 18—25 mm long, equal in length or the outer ones slightly shorter, the three outer ones broad-ovate, subcoriaceous, the two inner ones narrower, ovate-oblong, more membranous; minutely mucronulate at the obtuse apex. Corolla white or yellow, large, broadly funnel-shaped, 4.5—6 cm long, the limb slightly lobed. Filaments dilated and hairy below, the corolla inside above the place of insertion of the filaments with a semicircular thickening; anthers spirally twisted, hairy, disk 5-angular, 2 mm high. Ovary glabrous; style glabrous, not articulate at the base. Capsule opening by 4 valves, 4-celled, 4-seeded; valves splitting longitudinally into several laciniae. Seeds densely yellowish to dark-brown tomentose and long villose.

MALAY PENINSULA, Dindings, Pangkor, SCORTECHINI 1074, July 1884 (K); id., RIDLEY 7158, March 1896, y<sup>1</sup>) (K, S); Pahang, RIDLEY 141, May 1890 (S); Pulau Tioman, BURKILL s.n., June 1915 (S); Pekan, RIDLEY s.n., Aug. 1889 (S); Kuala Lipis, BURKILL and HANIFF 15701, Nov. 1924, y (K, S); Negri Sembilan, Bukit Danan, ALVINS 284 (594), Jan. 1885 (S); Malacca, Selandor, DERRY 377, Nov. 1889 (S); id., ALVINS s.n., March 1886 (S); Chabau, ALVINS 2217, Sept. 1885 (S); Singapore, Botanic Gardens, SAPPAN s.n., March 1932, y (B, S).

SUMATRA, Mt. Tengamoes, 1500 ft, FORBES 1837 (BD, L); Atjeh and Dependencies, Simaloer, ACHMAD 321, March 1918, w<sup>1</sup>) (B, L); East Coast, YATES 1012 (B); Senembah, S.E. of Medan, grassfield, 30—50 m, LÖRZING 3598, March 1915, y (B, L); Haboko Estate, edge of virgin forest, c. 150 m, DOCTERS VAN LEEUWEN 3187, Febr. 1919, y (B); Badjalinggi, S. of Tebingtinggi, c. 100 m, LÖRZING and JOCHIMS 7532, Oct. 1920 (B); Asahan, Hoeta Padang, near the Continental Plantation Company concession, in forests on "red" soil, along river, KRUKOFF 4434, Nov.-Dec. 1932 (L, S); Tapanoeli, Nias, VON RÖMER XVII, y (B, mixed with *Merremia umbellata* (L.) HALL.f.); Batoe island, RAAP 201, Sept. 1894 (B); West Coast, Pariaman, DIEFENHORST 2910 HB (B, L, U); Doekoc, KORTHALS s.n. (L); Soeka Menanti, Ophir district, thickets, frequent, 120 m, BÜNNEMEYER 194, Apr. 1917, y (B); Talakmau, W.-slope, common, c. 400 m, BÜNNEMEYER 345, Apr. 1917, y (B); Mocara Laboeh, c. 700 m, ULTÉE 122 (B); Mentawai-islands, Sipora, near Sioban, IBOET 364, Oct. 1924, y (B, L); Benkoelen, Enggano, virgin forest behind Meok, LÜTJELARMS 3602, May 1936 (B, L); id., near Boea boca, c. 100 m, LÜTJELARMS 4419, June 1936 (B, L); Lampoenigs, G. Raté Telanggaran, slope, c. 400 m, IBOET 81, Nov. 1921, y (B); Kotaboemi estate, c. 50 m, administrator of Kotaboemi estate 9, March 1924, y (B); Sebesi-island, frequent, edge of virgin forest, c. 100 m, DOCTERS VAN LEEUWEN 5364, Apr. 1921, y (B); Riouw and Dependencies, Anambas islands, Siantan, Terempa, HENDERSON, Singapore Field n. 20156, March 1928 (S); id., near the coast in secondary forest, rather frequent, 75 m, VAN STEENIS 781, March 1928, y (B, L, S); id., Temaja, padang near Letong, on rocks, c. 200 ft, HENDERSON, Singapore Field n. 20487, Apr. 1928 (B, K, S); Bangka, KOBUS s.n. (B); Batoe roesa, TEYSMANN s.n. (B, L).

<sup>1</sup>) y: flowers yellow, w: flowers white.



JAVA, without precise locality, BLUME s.n. (B, U); HORSFIELD Conv. 15 and 15 bis (K); KUIHL and VAN HASSELT s.n. (L); PLOEM s.n. (B); Bantam, Pasaoeran, sec. forest, 25 m, BACKER 7275, March 1913 (B); between G. Kendeng and Malingping, 100—300 m, BACKER 1334, June 1911, y (B); G. Kantjana, very frequent, KOORDERS 41118 $\beta$ , June 1912, y (B); Batavia, Tjikoja, ZOLLINGER 503, Aug., y (BD, K, L); Buitenzorg, Depok, 93 m, KOORDERS 31155 $\beta$ , Aug. 1898 (B); id., KOORDERS 42555 $\beta$ , Febr. 1914 (B); id., KOORDERS 44068 $\beta$ , July 1918, y (B); id., KOORDERS 44151 $\beta$ , July 1917, y (B); id., SOEGANDIRENJA 329, June 1900 (B, L); Buitenzorg, BOERLAGE s.n., Febr. 1889 (K, L); id., HALLIER s.n., Febr. 1896 (B); id., cultivated in the Botanic Garden XV, H. 21; XV. H. 21a; XV. G. 74; XV. G. 74a (B); G. Wangoen, between Tjidjeroek and Paboearan, S. of Batatoolis, rare, HALLIER s.n., Aug. 1896 (B); Moeara Tjiomas, BOERLAGE s.n., Sept. 1888 (L); G. Tjipoeti, near Tjampea, edge of forest, bank of Tjiteureup, 500 m, BAKHUIZEN VAN DEN BRINK 4195, Sept. 1920, y (B, L); Pasir Angsana, Tjibata, S.W. of Leuwiliang, BAKHUIZEN VAN DEN BRINK 7815, Aug. 1931, y (B, K, L, P); S. of Leuwiliang, thickets, 500 m, BACKER 25967, Sept. 1918 (B); Palaboeanratoe, young forest, KOORDERS 34661 $\beta$  (B); id., KOORDERS 34662 $\beta$ , y (B); Tjikante near Tjiloa, Zandbaai, thickets, 50 m, BACKER 25638, Aug. 1918 (B, L); G. Kate near Soekaboemi, sec. forest, 400 m, BACKER 15065, July 1914 (B); Bodjonglopang, thickets, frequent, 500—600 m, BACKER 16960, Nov. 1914 (B); between Lengkong and Tjitjoeroeg, edges of sec. forests and thickets, 500—600 m, BACKER 17142, Nov. 1914 (B); Tjikembar, thickets, 300 m, BACKER 16890, Nov. 1914 (B); Tendjo, thickets, rather frequent, 80 m, BACKER 24050, Apr. 1918 (B); Salak, BLUME s.n. and 1505 (L, *type of Ipomoea nymphaefolia* BL.); Salak, near Bobodjong, 700 m, KOORDERS 24178 $\beta$ , Sept. 1896, y (B, L); Priangan, Kalipoetjang, SCHIEFFER s.n. (B); Banjoemas, Noesa Kambangan, near Karang-tengah, c. 50 m, VAN STRAELEN 26, Apr. 1918 (B); Kediri, Prigi, plain behind beach, frequent, 5 m, BACKER 12008, Febr. 1914 (B); Malang, Tangkil, virgin forest Sempol, 200—300 m, KOORDERS 23380 $\beta$ , June 1896, y (B); id., 400—500 m, KOORDERS 23694 $\beta$ , June 1896 (B); Tengger, 400 m, BUYSMAN 206, Aug. 1907 (U); Besoeki, Blambangan, HORSFIELD (according to MIQUEL).

BORNEO, without precise locality, KORTHALS s.n. (L); W. division, Kapoeas, TEYSMANN 8295 (B); S. and E. division, Bandjermasin, KORTHALS s.n. (L); Martapoera, KORTHALS s.n. (L); Soengei Bloe-oe, JAHIERI 1055, exped. NIEUWENHUIS (B, mixed with *Merremia Korthalsiana* VAN OOSTSTR.; L); P. Laoet, N.E. of Stagen, 75 m, VAN SLOOTEN 2300, Nov. 1928, y (B, L, U); Hayoep, WINKLER 3383, Sept. 1908, y (BD); Sarawak, BECCARI 665 (BD, K); Baram district, Baram, HOSE 221, Nov. 1894 (K); British North Borneo, CREAGH s.n. (K); Banggi, FRASER 213, March 1885 (K); Tenom, everywhere over bamboos and trees, 700 ft, GIBBS 2908, Jan. 1910, w (K); Lahut Dalu, CREAGH s.n., Apr. 1895, y (K).

CELEBES, without precise locality, "common in the lower parts", SARASIN 1103, May 1895, y (BD); DE VRIESE 215, y (L); G. Padang Kadjang, RACHMAT 829, exped. VAN VUUREN, Nov. 1913 (B); Beroe-beroe, RACHMAT 331, exped. VAN VUUREN, July 1913 (B); Celebes and Dependencies, Balotji Sehroh, TEYSMANN 12598 (B); Kendari, forest, 100 m, KJELLBERG 700, March 1929 (B); Emekang, forest on bank, KJELLBERG 1372, May 1929, y (B); Manado, Minahassa, HOSE 795 (K); Amoerang, KOORDERS 16565 $\beta$ , March 1895 (B, L); id., KOORDERS 16566 $\beta$ , Apr. 1895 (B, BD, L); id., KOORDERS 16567 $\beta$  (B, L); between Rano ketang and

Amoerang, KOORDERS 16568 $\beta$ , March 1895 (B, K); between Manado and Tomohon, very frequent, especially between 200—400 m, KOORDERS 16569 $\beta$ , Jan. 1895, y (B, L); near Ajermedidi, in young thickets, very frequent near bridge of Tondano river, on volcanic sand, 150 m, KOORDERS 16570 $\beta$ , Dec. 1894, y (B, L).

MOLUCCAS, Halmaheira, Tobelo, administrator of Tobelo, May 1919 (B); Ternate, Lagoena, thickets, c. 300 m, BEGUIN 627, May 1920, w (B, L); Ceram, between Kabailoe and Manco, virgin forest, 200—400 m, RUTTEN 241, Oct. 1917, w (B); Wai Moessi, virgin forest, 0—100 m, RUTTEN 408, Nov. 1917, w (B); W. Ceram, E. of Laioewin, virgin forest, c. 100—200 m, RUTTEN 1696, Sept. 1918, w (B, L, U); S.E. Ceram, Kotta, 100—200 m, KORNASSI 1016, Febr. 1918, w (B, L); Amboina, ROBINSON, Pl. Rumph. Amb. 401, July—Nov. 1913, w (B, K, L, P); G. Haroemesen, 0—100 m, KORNASSI 1183, Apr. 1918, w (B, L, U).

NEW GUINEA, Mamberamo, Taua, bank of river, MOSZKOWSKI 233, July 1910, w (BD); Sabang-camp, virgin forest, VERSTEEG 1741, Sept. 1907, w (B); Hollandia, c. 10 m, GJELLERUP 178, July 1910, w (B); Rouffaer river, frequent, 175 m, DOCTERS VAN LEEUWEN 10179, Aug. 1926, w (B); Nassau Mountains, Explorateurs bivak, edge of ladang, c. 700 m, DOCTERS VAN LEEUWEN 10513, Oct. 1926, w (B); Kloofbivak, on sandy soil, PULLE 225, Oct. 1912, w (B); near Gelieb, BRANDERHORST 158, Oct. 1907 (B); Territory of New Guinea, Matatakum, WEINLAND 285, June 1890 (B, BD, S); Nuru River, 160 m, LAUTERBACH 2246, June 1896, w (BD); Sepik River, Malu, riverbanks, 20—40 m, LEDERMANN 6853, March 1912, w (BD); Alexis-hafen, WIESENTHAL 30, Nov. 1912, w (BD); Papua, Strickland River, BAEUERLEN (according to VON MUELLER, 1886); Koitaki, forest, c. 1500 ft, CARR 12632, June 1935, w (L); Lower Fly River, east bank, opp. Sturt Island, common on river bank, BRASS 8191, Oct. 1936, w (L).

BISMARCK ARCHIPELAGO, according to WARBURG and to SCHUMANN and LAUTERBACH.

PHILIPPINE ISLANDS; according to MERRILL often common in secondary forests, at low and medium altitudes. Luzon, AMIERN 297 (B); AMIERN 226 (B); prov. Laguna, Los Baños, CURRAN 13241, March 1912 (K); id., MERRILL, Spec. Blanc. 952, Nov. 1915 (B, BD, K, L); Mt. Maquiling, ROBINSON and FOXWORTHY, Bur. of Sc. 17273, Febr. 1913 (L); prov. Tayabas, Kabibihan, RAMOS, Bur. of Sc. 13307, Febr.-March 1911 (BD, K, L); prov. Sorsogon, Irosin, Mt. Bulusan, ELMER 15605, Dec. 1915 (B, K, L, U); Mindoro, Baco, MERRILL 1665, March 1903 (BD); Mindanao, distr. Davao, Todaya, Mt. Apo, ELMER 10836, June 1909 (B, L); Camaguin de Mindanao, RAMOS, Bur. of Sc. 14665, March-Apr. 1912 (B, L); Palawan, Bermejos, Bur. of Sc. 265, Dec. 1905 (BD); Paragua, E-wig River, MERRILL 698, Febr. 1903, y (BD); according to MERRILL the species has been collected also in Balabac, Samar, Leyte and Panay.

CHRISTMAS ISLAND, Murray hill track, RIDLEY 90, Oct. 1904, y (K).

Distribution: Madagascar, Mascarenes, Seychelles, Malay Peninsula, Malay Archipelago, Philippines, New Guinea, N. and E. Australia, Polynesia.

Vernacular names: akar ulan, akar ulan gajah (Malay Peninsula, ALVINS); akar sambang, akar sambong, akar sambon (Mal., W. Sumatra, BÜNNEMEYER, DIEPENHORST, MIQUEL); rabana oeding (Simaloer, ACHMAD); akar lonkemboeng (Mal., Palembang, according to LÜTJE-

HARMS); ritang (Bangka, KOBUS); melading (Mal., Bangka, HEYNE); areuj tjarajoen, tjarajeun (Sund., Java, BLUME, HEYNE, KOORDERS, SCHEFFER); areuj kpalompong, areuj kipaloempoeng (Sund., Buitenzorg, Bantam, KOORDERS, BAKHUIZEN VAN DEN BRINK); akar belaran (Noesa Kambangan, VAN STRAELEN); kloerak, kangkoeng tirta (Jav., Malang, KOORDERS); tappagadja (Mal., MIQUEL); boekaloeng (Bali, MIQUEL); blaran (S.E. Borneo, P. Laoet, VAN SLOOTEN); balanteteh, talabo (Celebes, RACHMAT); wanaring, manaring (Minahassa, Tontemboan and Tonsea language, HALLIER, HEYNE, KOORDERS); tichinian (Minahassa, Tonsawang language, HALLIER, HEYNE, KOORDERS); daoen ramboet, obat ramboet (Mal., Ambon, HEYNE); halen, hailale (Alf., Amboina, RUMPHIUS, MIQUEL, HEYNE, KORNASSI); long (S. Halmaheira, Weda, HEYNE); koegè, koegètè (N. Halmaheira, HEYNE); koegè (Ternate, BEGUIN, HEYNE); budakín (Philipp.: Bagóbo language); bulakán (Philipp.: Tagálog and Bisáya language); bulak-bulakán (Philipp.: Bíkól language); burákan (Philipp.: Samar-Leyte Bisáya, Bíkól and Súlu language); tampinita (Philipp.: Subánun language) (the Philippine names all after MERRILL).

Use: The tubers are edible. For medicinal use see HEYNE l.c.

Remarks. *M. peltata* has been based by MERRILL on LINNAEUS's *Convolvulus peltatus* (1753), a white-flowered species from Ambon, described by RUMPHIUS in his *Herbarium Amboinense* (V, 1747, p. 428, t. 157, fig. 1, 2) under the name of *Convolvulus laevis indicus major* (alba). *Ipomoea nymphaefolia* has been described by BLUME in 1825 on yellow-flowered specimens from Java, and later on placed in the genus *Merremia* by HALLIER under the name of *M. nymphaefolia*.

MERRILL, discussing the identity of the plant of RUMPHIUS, points out that he cannot detect a single character by which the species *M. peltata* and *M. nymphaefolia* can be distinguished except the colour of the flowers. With this finding I fully agree. The yellow-flowered form appears to be constricted, with a few exceptions, to the western part of the area of the species, whereas the form with white flowers occurs in the eastern part. As the collector's labels are unfortunately often very incomplete as to the colour of the flowers, it is in many cases impossible to decide, to which form a specimen belongs. As far as possible the specimens with white and with yellow flowers are indicated above respectively with w and y.

PRAIN, 1894, describes the colour of the corolla as yellowish-white with red spots in the Mascarene Islands, yellow or white or purplish in Malaya, white in N. Australia and Polynesia. (See remarks under *M. umbellata* (L.) HALL. f.).

21. *Merremia Elmeri* MERRILL in Univ. Calif. Publ. Bot. XV (1929) p. 261.

A large woody twiner, the stems, the inflorescences and the lower surface of the leaves, especially the nerves greyish pubescent to villose. Stems stout, terete or slightly applanate, to 5—7 mm in diam., black or brownish black when dry, greyish pubescent, glabrescent. Leaves peltate, broad-ovate to orbicular, rounded to slightly retuse at the base, more or less abruptly acuminate to cuspidate at the apex, with a narrow and acute acumen; glabrous above, pubescent beneath, especially on the nerves; blade 6—20(—25) cm long and 5—17(—21) cm broad; the petiole shorter or longer than the blade, 3—14(—23) cm, glabrous or slightly pubescent; primary nerves 8—10 on each side of the midrib, curved at the margin; secondary nerves many, parallel; tertiary nerves reticulate. Inflorescences solitary or in pairs in the leaf-axils, 7 to 25 cm long, more or less secund; peduncles terete or applanate at the top, pubescent and glabrescent like the stems, patent, corymbosely branched at the ends, from about 5—15 cm above the base, several-flowered; bracts deciduous, the lower ones sometimes foliaceous, not peltate, pedicels angular, striate, sparsely hairy or glabrous, 7—15 mm long; flower-buds ovoid, acute or obtusish. Sepals smaller than in *M. peltata*, broad-elliptic to elliptic-oblong, 9—13 mm long, the outer ones concave, obtuse, glabrous, subcoriaceous, longitudinally striate outside, the inner ones thinner, obtuse or slightly emarginate, glabrous, all persistent and somewhat enlarged in fruit. Corolla white, except the blackish grey basal outer parts (MERRILL), funnel-shaped to campanulate, smaller than in *M. peltata*, 3—3.5 cm long, outside minutely granulose-glandular; the limb indistinctly lobed, with ciliate margin. Filaments inserted 5—7 mm above the corolla base, 5—6 (9, MERRILL) mm long, broadened at the base and there sparsely papillose at the margins; corolla base with a semicircular thickening above the place of insertion of each filament; anthers 5—6 mm long, twisted, villose. Ovary ovoid, glabrous, style filiform, c. 12—15 mm long; disk 1.5 mm high. Capsule subglobose to broad-conical, 2-celled, 4-seeded, the wall splitting into several valves, the valves striate outside; diameter of capsule 13—14 mm; seeds short-pubescent, brownish-black, the margins bearded with long brown hairs; length of seeds to 6.5 mm.

BORNEO, W. division, Goenoeng Kenepai, HALLIER 1844, Jan. 1894 (B); S. and E. division, Boeloengan, Tikoeng, AMDJAH 918, Nov. 1912, a fruiting specimen (B, K, L); British North Borneo, Elphinstone Prov., Tawao, sprawling over open thickets in recently cleared land in rather wet places, ELMER 20396, *type*, Oct. 1922—March 1923, a flowering specimen (B, BD, K, L, P, S, U).

Distribution: Borneo.

var. *glaberrima* VAN OOSTSTR., nov. var. Fig. 3, d—m.

Planta glaberrima, habitu speciei.

BORNEO, W. division, Soengai Saniai, HALLIER 3370, April 1894 (B, BD, K; L, type); Sarawak, BECCARI 3955 (K).

Distribution: Borneo.

#### Section 5. *Wavula* VAN OOSTSTR.

VAN OOSTSTR. in *Blumea* III (1939) p. 266.

Closely related to section *Xanthips*. Flower-buds ovoid to narrow-ovoid or oblong, subacute; the midpetaline bands of the corolla not with distinct dark lines; inflorescences subumbelliform; flowers moderate to large; top of the pedicels immediately below the calyx with a ring of small thick lobes.

22. *Merremia similis* ELMER in *Leafl. Philipp. Bot.* I (1908) p. 335 — ? *Convolvulus distillatorius* BLANCO, *Fl. Filip.*, ed. 1 (1837) p. 95; id., ed. 2 (1845) p. 70 (not seen); id., ed. 3, I (1877) p. 130 — *Merremia distillatoria* (BLANCO) MERRILL, *Spec. Blanc. in Philipp. Bur. of Sc. Publ.* 12 (1918) p. 325; id., *Enum. Philipp. Fl. Pl.* III (1923) p. 360 as to the specimens only.

"Subscandent and sprawling" (ELMER). Stems terete, smooth or finely striate, fistulose, 2.5–4.5 mm in diam., the young parts densely grey or rusty pubescent or farinose to short-tomentose, glabrescent; the glabrous parts dark brown in dried specimens. Leaves petiolate, the petiole short-tomentose like the stems, glabrescent, 3–17 cm long, the blade herbaceous to chartaceous, broad-ovate to orbicular, abruptly acuminate with narrow acumen, the base broadly cordate; densely short-tomentose with short curled hairs on both sides in youth, later the upper surface glabrescent, at last with some scattered white hairs, especially along the nerves, the lower surface with a dense short tomentum of rusty brown or greyish brown colour. Length of the blade 8.5–18(–20, ELMER) cm, width 8–16(–20, ELMER) cm. Primary nerves 7–10 pairs, curved at the margin, secondary nerves many, parallel, all distinctly prominent beneath, the tertiary nervation reticulate. Inflorescences axillary with a long peduncle, which is branched close to the top, the peduncle terete, tomentose to farinose like the stems, glabrescent, to 30 (according to ELMER to 60) cm long and 2–4 mm thick; the branches about 1 cm long or slightly longer. Pedicels gradually thickened to the top, with a thick lobed ring immediately below the place of insertion of the sepals, farinose, glabrescent towards the top, 2–3 cm long, in

fruit erect, 4—4.5 cm long. Bracts elliptic, 2—2.5 mm long, glabrous inside, densely short-tomentose outside, deciduous. Flower-buds narrow-ovoid to oblong, acute. Sepals concave, thin-coriaceous with membranous margin and with glandular dots, obovate to broad-elliptic or orbicular, obtuse, or the outer ones slightly retuse, minutely mucronate, to 15—18 mm long, the innermost one a little shorter, the calyx enclosing the fruit as a cup, the sepals then to 20 mm long. Corolla "white with a tinge of red" (ELMER), broadly funnel-shaped, slightly 5-lobed, 4 cm long, nearly glabrous, only with some hairs at the top of the mid-petaline bands. Filaments inserted about 12 mm above the corolla base, 16—18 mm long, glabrous except the somewhat dilated, pilose base; the corolla tube inside with two hair lines below the place of insertion of each filament. Anthers twisted, glabrous. Disk ring-shaped, high. Ovary conical, glabrous. Style glabrous,  $\pm$  28 mm long. Stigma biglobular, papillose. Capsule ovoid, 4-valved, about 15—18 mm long, the soon loosing thin outer layer of the valves brownish-black, later the valves are straw coloured outside, white inside. Seeds 6 mm long, black, sparsely tomentose and densely long villose.

PHILIPPINE ISLANDS, "in thickets and secondary forests at low and medium altitudes" (MERRILL). Luzon, Laguna (MERRILL); prov. Tayabas, without precise locality, TOPPING, Bur. of Sc. 1971, Dec. 1914 (B, BD, L, S); near Malicboi, TOPPING: MERRILL Spec. Blanc. 738, Dec. 1914 (B, BD, K, L); Kabibihan, RAMOS, Bur. of Sc. 13292, Febr.-March 1911 (K, L); Albay, Bataan island, MERRILL 11611, Sept. 1922 (BD, K); prov. Sorsogon, Irosin, Mt. Bulusan, ELMER 15602, Dec. 1915 (B, BD, K, L, P, U); Leyte, Palo, ELMER 7341, Jan. 1906, *type of M. similis* (B, K); Panay (MERRILL); Sibuyan, Magallanes, Mt. Giting-giting, ELMER 12061, March 1910 (B, K, L); Negros, Cadiz, CELESTINO, Bur. of Sc. 7342, Febr.-March 1909 (BD); Mindanao, prov. Surigao, RAMOS and PASGASIO, Bur. of Sc. 34753, June 1919 (L, S); prov. Misamis (MERRILL).

Distribution: Philippine Islands.

Vernacular names: bulakán (Philipp.: Panay Bisaya language, MERRILL); burakan (Philipp., MERRILL).

Remarks. MERRILL supposes that *Merremia similis* ELMER is identic with *Convolvulus distillatorius* BLANCO, for which MERRILL made the new combination *Merremia distillatoria* (BLANCO) MERRILL. If MERRILL is right, the latter name has priority. In my opinion it is not quite certain that the plant described by BLANCO is the same as ELMER's plant. It must be stated that there are some points of resemblance. BLANCO describes, however, the leaves as being about 5-nerved and having a toothed, though obscurely toothed margin, both characteristics not corresponding with those found in the specimens for which MERRILL used the name *M. distillatoria*. I therefore propose to reject MERRILL's

combination as being based on a dubious species and to use ELMER's name *M. similis*.

#### XIV. OPERCULINA S. MANSO

S. MANSO, Enum. Subst. Bras. (1836) p. 16 (not seen); PETER in ENGL.-PRANTL, Nat. Pfl. fam. IV, 3a (1891) p. 32; HALL. f. in ENGL., Bot. Jahrb. XVI (1893) p. 582; BOERL., Handl. Fl. Ned. Ind. II (1899) p. 502, 510; PRAIN in Journ. As. Soc. Bengal LXXIV (1906) p. 307; KOORDERS, Exk. fl. Java III (1912) p. 114; RIDLEY, Fl. Malay Penins. II (1923) p. 463; MERRILL, Enum. Philipp. Fl. Pl. III (1923) p. 363; BACKER, Onkruidfl. Jav. Suikerrietgr. (1931) p. 519 — *Spiranthera* BOJ., Hort. Maurit. (1837) p. 226 ex p. (not seen) — *Piptostegia* REICHB., Nom. (1841) p. 113 (not seen).

Large, herbaceous twiners; stems, peduncles and petioles often winged. Leaves entire, angular or digitate, often cordate at the base. Flowers large, axillary, solitary or in few-flowered cymes. Sepals large, mostly glabrous, pergameneous to coriaceous, brown, often ventricose, often much enlarged in fruit and becoming more or less coriaceous and then often with irregularly lacerate margin. Corolla large, broadly funnel-shaped or campanulate, white or yellow, glabrous or with hairy midpetaline bands. Stamens and style included. Stamens 5; filaments filiform, anthers large, often spirally twisted afterwards; pollen smooth, ellipsoid. Disk annular. Ovary glabrous, 2-celled, each cell with 2 ovules; style 1, filiform; stigma biglobular. Fruit a large, dry capsule, epicarp circumscissile, the upper part of it (operculum, lid) more or less fleshy, endocarp scarious, at first entire, at length irregularly splitting. Seeds 1 or more, large, trigonous or globular, glabrous, black.

Distribution: Tropics generally.

Remarks. PETER, l.c., divided the genus into 3 sections:

1. *Pteropodae* PETER, l.c. p. 32, leaves entire, peduncles winged.
2. *Apterae* PETER, l.c., leaves entire, peduncles not winged.
3. *Digitatae* PETER, l.c., leaves digitate, peduncles winged or not.

#### Key to the species.

- 1a. Stems terete. Sepals orbicular, broadly rounded to slightly emarginate at the apex. Midpetaline bands of corolla pilose . . . . . 3. *O. Riedeliana*.
- b. Stems alate or angular. Corolla glabrous . . . . . 2.
- 2a. Outer sepals pubescent, ovate to broad-ovate, acute to short acuminate . . . . . 1. *O. Turpethum*.
- b. Sepals glabrous, broad-elliptic to orbicular, broadly rounded at the apex . . . . . 2. *O. Brownii*.

1. *Operculina Turpethum* (L.) S. MANSO, Enum. Subst. Bras. (1836) p. 16 (not seen); HALL, f. in ENGL., Bot. Jahrb. XVIII (1894) p. 120; id. in Versl. 's Lands Plantent. 1895 (1896) p. 127; id. in Bull. Herb. Boiss. V (1897) p. 380; id. in Meded. 's Lands Plantent. XIX (1898) p. 545; BOERL., Handl. Fl. Ned. Ind. II (1899) p. 510; COOKE, Fl. Bombay II (1905) p. 240; PRAIN in Journ. As. Soc. Bengal LXXIV (1906) p. 308; HALL, f. in VALETON, Pl. Pap. in Bull. Dép. Agric. Ind. Néerl. X (1907) p. 51; DUTHIE, Fl. Upper Ganget. Pl. II (1911) p. 110; KOORDERS, Exk. fl. Java III (1912) p. 114; KOORDERS-SCHUM., Syst. Verz. (1910—13) Conv. p. 3; id., l.c. (1914) p. 110; MERRILL, Interpr. Rumph. Herb. Amb. (1917) p. 442; id., Spec. Blanc. in Bur. of Sc. Public. 12 (1918) p. 325; GAMBLE, Fl. Pres. Madras V (1923) p. 929; RIDLEY, Fl. Malay Penins. II (1923) p. 463; MERRILL, Enum. Philipp. Fl. Pl. III (1923) p. 363; BACKER, Onkruidfl. Jav. Suikerrietgr. (1931) p. 520 — *Convolvulus Turpethum* L., Spec. Plant. (1753) p. 155; Bot. Mag. (1819) t. 2093; ROXB., Fl. Ind. ed. CAREY and WALL. II (1824) p. 57; WALL., Cat. (1828) n. 1371; ROXB., Fl. Ind. I (1832) p. 476 (*C. Turpethum* WILLD.); HASSK., Pl. Jav. Rar. (1848) p. 518 — *Convolvulus anceps* L., Mant. I (1767) p. 43; VAHL, Symb. III (1794) p. 31 — *C. triqueter* VAHL, l.c. p. 30, the type of VAHL is unknown to me — *Ipomoea Turpethum* (L.) R. BR., Prodr. Fl. Nov. Holl. ed. 1 (1810) p. 485; Bot. Reg. IV (1818) t. 279; CHOISY in Mém. Soc. Phys. Genève VI (1833) p. 450; id. in DC., Prodr. IX (1845) p. 360; MIQ., Fl. Ned. Ind. II (1857) p. 606; id., Suppl. (1860) p. 235; BENTH., Fl. Austr. IV (1869) p. 418; CLARKE in HOOK., Fl. Brit. Ind. IV (1883) p. 212; HEMSL., Rep. Chall., Bot. I, 3 (1884) p. 169; VIDAL y SOLER, Rev. Plant. Vasc. Philipp. (1886) p. 196; v. MUELLER, Descr. Notes Pap. Pl. VIII (1886) p. 49; WATT, Dict. Econ. Prod. Ind. IV (1890) p. 493; WARB. in ENGL., Bot. Jahrb. XIII (1891) p. 413; TRIMEN, Handb. Fl. Ceyl. III (1895) p. 222; MANSON BAILEY, Queensl. Fl. IV (1901) p. 1060; id., Compr. Cat. Queensl. Pl. (1909) p. 349; GAGNEP. et COURCH. in LEC., Fl. Indo-Chine IV (1915) p. 263; BOLD., Zakfl. Java (1916) n. 827 — *I. anceps* (L.) R. et S., Syst. IV (1819) p. 231; BLUME, Bijdr. (1825) p. 714 (*I. anceps* VAHL); CHOISY in Mém. Soc. Phys. Genève VI (1833) p. 450; id. in DC., Prodr. IX (1845) p. 360; ZOLL., Syst. Verz. 2. Heft (1854) p. 129 — *I. triquetra* (VAHL) R. et S., Syst. IV (1819) p. 231; CHOISY in DC., Prodr. IX (1845) p. 360, see above under *Convolvulus triqueter* VAHL — *Spiranthera Turpethum* (L.) BOJ., Hort. Maurit. (1837) p. 226 (not seen) — *Convolvulus maximus* BLANCO, Fl. Filip. ed. 1 (1837) p. 91; ed. 2 (1845) p. 67 (not seen); ed. 3, I (1877)



p. 127, non L., nec BUCH. HAM. (according to MERRILL) — *I. reptans* LIANOS, *Fragm. Pl. Filip.* (1851) p. 55; F.-VILL. and NAVES in BLANCO, *Fl. Filip.*, ed. 3, IV 1 (1880) p. 39, non POIR. (according to MERRILL) — *I. ventricosa* LIANOS, l.c. p. 56; F.-VILL. and NAVES, l.c. p. 40, non G. DON (according to MERRILL) — *Argyreia alulata* MIQ., *Fl. Ned. Ind.* II (1857) p. 587 — *Ipomoea Turpethum* (L.) R. BR. var. *anceps* MIQ., *Fl. Ned. Ind.* II (1857) p. 607 — *Argyreia alata* MONTR. in *Mém. Acad. Lyon* X (1860) p. 236 — *Operculina Turpethum* (L.) PETER in ENGL.-PRANTL, *Nat. Pfl. fam.* IV, 3a (1891) p. 32; SCHUM.-LAUTERB., *Fl. Deutsch. Schutzgeb.* (1901) p. 518 — *Ipomoea diplocalyx* BAKER in *Kew Bull.* (1894) p. 71 — *Operculina Turpethum* (L.) S. MANSO var. *heterophylla* HALL. f. in *Versl. 's Lands Plantent.* 1895 (1896) p. 127; BOERL., *Handl. Fl. Ned. Ind.* II (1899) p. 510 — *Merremia Turpethum* (L.) RENDLE in THIS.-DYER, *Fl. Trop. Afr.* IV, 2 (1905) p. 102.

Perennial herb. Roots long, slender, fleshy, much branched. Stems robust, twining, narrowly 3—5-alate (wings green or more or less purplish, BACKER), sulcate or angular, often strongly contorted, 2—4 m high (BACKER), up to 4, sometimes to 6 mm in diam., glabrous or sparsely short-pilose, especially at the nodes, the young parts sometimes more or less tomentose. Leaves petiolate, petiole much shorter than the blade, short-pilose, slender, terete or occasionally alate, 2.5—7.5 cm long; blade very variable in form, orbicular, broad-ovate to ovate-lanceolate or lanceolate, entire or sometimes coarsely dentate or slightly lobed, apex acuminate, acute or obtuse, mucronulate, base cordate, sometimes hastate; glabrous or appressed pilose above, pubescent beneath. Midrib and primary nerves prominent beneath, primary nerves 8—11, secondary nervation parallel. Broad leaves: 5.5—15 cm long and 4—14 cm broad, narrow leaves 5.5—7.5 cm long, 1—2.5 cm broad. Inflorescences 1-flowered or cymosely branched, few-flowered; peduncles axillary, mostly terete and glabrous or pubescent at the base, upwards applanate and pubescent, 2—18 cm long, occasionally the peduncles are alate like the stems; pedicels angular, pubescent, 12—15 mm or those of the middle flower to 35 mm long, clavate and elongated in fruit, to 40 mm long; bracts large, concave, oblong or elliptic-oblong, mucronulate, scarious, pubescent, short-ciliate at the margin, 1.5—2 cm long, deciduous. Sepals ovate or broad-ovate, acute or short-acuminate, mucronulate, the outer ones pubescent outside, the inner ones completely or partly glabrous, outer 1.5—2.5 cm long, inner about 2 cm long; in fruit the sepals are 3—3.5 cm long and the calyx is very broadly cup-shaped and to 6 cm in diameter. Corolla broadly funnel-shaped, 3—4.5 cm long, glabrous,

white or white with yellowish base (BACKER). Stamens inserted about 7 mm above the corolla base, dilated and sparsely pubescent below, with a tooth above the place of insertion. Ovary globular, glabrous. Style filiform, 15—17 mm long, stigmas globose, papillose. Capsule depressed-globose, 1.5 cm in diam., the epicarp circumscissile, the upper part (lid) fleshy; the endocarp scarious, irregularly dehiscent. Seeds 4 or less, smooth, black, opaque, 6 mm in diameter.

MALAY PENINSULA, Malacca, GRIFFITH s.n. (according to PRIN, 1906; according to RIDLEY, 1923, "GRIFFITH's plant in Herb. Kew was collected in Mergui, and no one else has found it in the Peninsula").

SUMATRA, without precise locality, KORTIALS s.n. (L); Lampaengs, Sebesi island, in mixed forest, frequent, DOCTERS VAN LEEUWEN 5170, Apr. 1921 (B); Krakatau, S.E. side, c. 200 m, forest in ravine, DOCTERS VAN LEEUWEN 6018, Jan. 1922 (herb. D. v. L.); id., c. 100 m, wall of ravine, DOCTERS VAN LEEUWEN 6020, Jan. 1922 (herb. D. v. L.); id., ravines far behind the beach, BOEDIJN 2509 A, Apr. 1933 (B); see remarks.

JAVA, according to BACKER from West to East Java, in the parts with a rather to very strong east monsoon, in thickets and hedges, occasionally in sugar plantations as a weed; Bantam, Oedjong Koelon, AMDJAR 41, Oct. 1913 (B); Batavia, Batavia, in thickets, BACKER 31879, Apr. 1904 (B); Bidaratjina, EDELING (?) s.n. (B); Tjikoja (according to ZOLLINGER, 1854); Pesing, W. of Batavia, 5 m, on bushes in alang fields, BACKER 31878, Jan. 1904 (B); id., BACKER 31880, Sept. 1904 (B); Tjikao, near waterfall, BLUME 1219, July (L); Kandangsapi, KORTIALS s.n. (L); Buitenzorg, Buitenzorg, cultivated in the Botanic Garden, n. X. F. 34a (L); X. F. 51 (L); XV. H. 16 (B); XV. H. 16 A (according to HALLIER, 1896); XV. H. 24 (B, type of var. *heterophylla* HALL. f.); XV. K. B. XII. 12 (B, a specimen from Merauke, N. Guinea); HALLIER C 12a, May 1893 (L); near Tjitarik, along road to Palaboeanratoe, Miss BIK s.n., Aug. 1922 (B); Priangan, Rawah Lakbok; S. of Tjikawoeng, 20 m, in bushes, many specimens, BACKER 4310, Aug. 1912 (B); Cheribon, Losarang, 3 m, bank of small river, BACKER 16776, Sept. 1914 (B); Pekalongan or Semarang, between Soebah and Weleri, 1 m, dike of railroad, frequent, BACKER 16551, Sept. 1914 (B); Semarang, Semarang, along Banjir canal, thickets, 10 m, DOCTERS VAN LEEUWEN s.n., May 1910 (B); virgin forest near Kedoengdjati, 10 m, KOORDERS 24875 $\beta$ , Sept. 1896 (B, L); Djapara-Rembang, Ngarengan, 50 m, teak-wood, KOORDERS 35607 $\beta$ , June 1899 (B); Soerakarta, HORSFIELD s.n. (K, L; U, type of *Argyreia alulata* MIQ.); Soerakarta, c. 100 m, HEINKEN (?) s.n. (B); Madioen, Babadan, 80 m, in hedge, WISSE 660, May 1921 (B); Malang, "in arenosis maritimis prov. Malang", ZOLLINGER 1439 (BD); Djati-roto, 20 m, bushes, frequent, BACKER 7911, May 1913 (B).

BORNEO, S. and E. division, Riam arinawe, KORTIALS 245 (L).

CELEBES, Celebes and Dependencies, without precise locality, KJELLBERG 3142 and 3143 (B); near Tempé, WEBER s.n. (L); Wavotobi Do., 100 m, KJELLBERG 855, March 1929 (B); Manado, Tonsawang, near Loboc, 400 m, on volcanic sand, rare, KOORDERS 16577 $\beta$ , March 1895 (B, BD, L).

SOEMBABA, Dompoe, ZOLLINGER 1439 (L).

SOEMBA, Kendara, IBOET 128, March 1925. (B, L).

TIMOR, without precise locality, without collector's name (BD, L, P, specimens named *Convolvulus Riedlei* CHOISY); S. M. Timor, Kaslooe, Molo, c. 1350 m, Mrs. WALSH 414, May 1929 (B).

MOLUCCAS, Ternate, Ngade, 20 m, bushes, BEGUIN 1150, Nov. 1920 (B); Sanoto(?) Besar, 250 m, bushes, BEGUIN 1551, Apr. 1921 (B, L); Kai-islands, JAHERI 173 (B); Groot Kai n. 2434 (B, from a specimen collected on Groot Kai cultivated in the Botanic Garden at Buitenzorg); Aroe-islands, beach, WARBURG (according to WARBURG); Timorlaoet, RIEDEL s.n. (K).

NEW GUINEA, Dutch New Guinea, Merauke, KOCH 27 (B, L, the specimen in L from Gouankeke); Merauke, alang-field, VERSTEEG 1916, Oct. 1907 (B); Territory of New Guinea, HELLWIG 101, Aug. 1888 (B, BD, K); Papua, Saibai-Island, MACFARLANE (according to VON MUELLER, 1886); near Port Moresby, LAWES (according to VON MUELLER, 1886); Gaima, Lower Fly River, east bank, BRASS 8317, Nov. 1936 (L).

BISMARCK ARCHIPELAGO, New Britain (Neu Pommern), VON HÜGEL (according to SCHUMANN and LAUTERBACH, 1901); Gazelle-peninsula, Ralum, in secondary forest, LAUTERBACH 119, May 1890 (BD); id., native garden, DAILL 238, Aug. 1895 (BD).

PHILIPPINE ISLANDS, according to MERRILL, 1923, in the Batan Islands, in Luzon (Ilocos Norte, Bontoc, Lepanto, Union, Rizal, Laguna, Batangas), Balabac, Culion, Palawan, Cebu, Ticao and Mindanao; "common in waste places, thickets etc., at low and medium altitudes". Luzon, without precise locality, CUMING 644 (K); id., LOHER 4139 (K); prov. of Ilocos Norte, Bangui, RAMOS, Bur. of Sc. 27412, Febr.-March 1917 (B); Lepanto, RAMOS, Bur. of Sc. 7045, Jan. 1909 (L); prov. of Union, Bauang, ELMER 5571, Febr. 1904 (BD, K); Rizal prov., Antipolo, MERRILL, Spec. Blanc. 554, Dec. 1914 (B, K, L); Rizal prov., Bosoboso, AHERN's collector, For. Bur. 1999, Nov.-Dec. 1904 (B, BD, K, S); id., Manila, MERRILL 5167, Febr. 1906 (BD, K); id., Manila, MERRILL 650, Jan. 1903 (BD, K); prov. of Laguna, Los Baños, ROBINSON, Bur. of Sc. 17364, Apr. 1913 (L); Balabac, MANGUBAT, Bur. of Sc. 436, March-Apr. 1906 (BD); Culion, MERRILL 538, Dec. 1902 (K); id., MERRILL 620, Dec. 1902 (BD); Palawan, BERMEJOS, Bur. of Sc. 298, Jan. 1906 (BD).

Distribution: Trop. East Africa, Mascarenes, Seychelles, British India, Ceylon, Indo-China, Malaysia, trop. Australia, Polynesia; introduced in the West Indian Islands.

Vernacular names: Indian jalap; turpeth-root; aroj djotang, aroj djotang bener, aroj jutton bener, aroi djeton bener (Sund., HASSKARL, MIQUEL, KOORDERS); sampar-kidang, sampar kedong (Jav., Semarang, KOORDERS); sampar-kebo (Jav., Djapara-Rembang, KOORDERS); balaran (Jav., BACKER); rajoedan (Jav., BACKER); langoewi (Soembawa, ZOLLINGER); non loli (Timor, WALSH); bangbañgau, laplapsut (Philipp.: Ilóko language, MERRILL); burákan (Philipp.: Samar-Leyte Bisáya language, MERRILL); kamokamotihan (Philipp.: Tagalog language, MERRILL).

Use: "The bark of the roots is by the natives employed as a purgative, which they use fresh, rubbed up with milk. About six inches in length of a root as thick as the little finger, they reckon a common

dose" (ROXBURGH). See WATT, Diet. Econ. Prod. Ind. IV (1890) p. 493—496.

Remarks. The 3 numbers from Krakatau mentioned above are all without flowers. They have been provisionally placed here as I am not quite sure they really belong to the species.

2. *Operculina Brownii* VAN OOSTSTR., nov. nom. — *Ipomoea alata* R. BR., Prodr. Fl. Nov. Holl. ed. 1 (1810) p. 484; CHOISY in DC., Prodr. IX (1845) p. 369; BENTH., Fl. Austr. IV (1869) p. 418; MANSON BAILEY, Queensl. Fl. IV (1901) p. 1060; id., Compr. Cat. Queensl. Pl. (1909) p. 347, fig. 326 on p. 350 — *Convolvulus alatus* (R. BR.) SPRENG., Syst. I (1825) p. 596, non *Operculina alata* (HAM.) URB.

Plant completely glabrous. Stems slender, twining, angular to narrow-alate, the thickest parts about 3 mm in diam. Leaves rather remote, petiolate, petiole much shorter than the blade, about 1—2 cm long; blade narrow-ovate-oblong to ovate, long attenuate to the acute or obtusish, mucronulate top, 5.5—8.5 cm long, 2—4.5 cm broad; nervation prominent beneath, pale, primary nerves 7—8 on each side of the midrib. Peduncles axillary, stout, angular to narrow-alate, 2—3.5 cm long, pedicels angular, clavate above, 1.5—2.5 cm long, much thickened in fruit. Sepals broad-elliptic to orbicular, broadly rounded at the apex, 22—25 mm long, the inner ones only slightly shorter than the others, all much enlarged in fruit, to 30 mm long. Corolla funnel-shaped, to 5 cm long (the specimen examined bears only 1 flower). Ovary globose to conical, glabrous. Disk low, annular. Capsule large, 3.5—4 cm in diam., enclosed by the large, cup-shaped calyx. Seeds dull black, 1.5 cm long.

THURSDAY ISLAND, JAHERI 490 (B); also mentioned from this locality by MANSON BAILEY. The type was collected on the islands off Cape Wilberforce (Australia, Northern Territory) by ROB. BROWN.

Distribution: Australia (N. Territory, N. Queensland).

Remarks. I believe that the American *O. alata* (HAM.) URB. (= *Convolvulus alatus* HAM.; *O. altissima* (MART.) MEISSN.; *O. pterodes* (CHOISY) MEISSN.) is a very closely related though distinct species. The materials of *O. alata* I could examine have the flowers yellow instead of white; the leaves are thinner than in the Australian species; moreover the fruits in *O. alata* are smaller and so are the seeds.

3. *Operculina Riedeliana* (OLIV.) VAN OOSTSTR., nov. comb. — ? *Convolvulus bufalinus* LOUR., Fl. Cochinch. I (1790) p. 109 — ? *Ipomoea bufalina* (LOUR.) CHOISY in Mém. Soc. Phys. Genève VI (1833) p. 452; id. in DC., Prodr. IX (1845) p. 360 — *Convolvulus platypeltis* ZIPP. ex SPANOGHIE in Linnæa XV (1841) p. 338, pro synonym. — *Ipomoea*

*Riedeliana* OLIV. in HOOK., Ic. Ser. III, V, 1 (1883) t. 1424 — *Merremia Riedeliana* (OLIV.) HALL. f. in ENGL., Bot. Jahrb. XVI (1893) p. 552; id. in Versl. 's Lands Pl. t. 1895 (1896) p. 127; BOERL., Handl. Fl. Ned. Ind. II (1899) p. 509; KOORDERS, Exk. fl. Java III (1912) p. 112 — *Ipomoea petaloidea* CHOISY var. *andamanica* PRAIN in Journ. As. Soc. Bengal LXIII (1894) p. 110 — *Merremia bufalina* (LOUR.) MERR. and ROLFE in Philipp. Journ. Sc. III (1908) p. 122, quoad specim. tantum — *M. crispatula* (WALL.) PRAIN var. *andamanica* (PRAIN) PRAIN in Journ. As. Soc. Bengal LXXIV (1906) p. 307 — *M. platypeltis* (ZIPP. ex SPANOGHE) PRAIN l.c. p. 307 — *Operculina bufalina* (LOUR.) HALL. f. in Meded. Rijksherb. Leiden 1 (1910) p. 26, quoad specim. tantum; MERRILL, Enum. Philipp. Fl. Pl. III (1923) p. 363, quoad specim. tantum.

All parts of the plant with exception of the midpetaline bands of the corolla glabrous. Stems climbing, robust, terete, to 3—5 mm in diam., reddish brown in dry specimens, more or less woody, fistulose or with pith. Leaves petiolate, petiole thin, slender, 2—10 cm long, dark brown to black in dry specimens; blade often reddish brown when dry, broad-ovate to orbicular or sometimes narrower, oblong, rarely to narrow-oblong, occasionally contracted at about the middle, more or less abruptly acuminate with sharp, mucronulate point; broad-cordate at the base (in narrow leaves the base is sometimes slightly cordate to truncate), 8—18 cm long, (3—)6.5—15 cm broad; primary nerves about 7—8 on each side of the midrib, secondary nerves parallel. Peduncles axillary, shorter or longer than the petioles, 2—11 cm long, as thick as the stems or slightly thinner, terete below, applanate upwards, 1—several-flowered; bracts oblong, 10—15 mm long, scarious, deciduous; pedicels 1—2(—3) cm long, clavate above, much thickened in fruit. Sepals about equal in length, orbicular, broadly rounded to slightly emarginate and minutely mucronate at the apex, the exterior ones leathery, the interior with broad scarious margin, 13—17 mm long, in fruit to 20 mm and then the calyx cup-shaped and enclosing the capsule. Corolla pale yellow, in young flower-buds densely sericeo-pilose; when adult widely funnel-shaped with only the midpetaline bands densely sericeo-pilose outside. Length of corolla 4—5 cm. Filaments inserted about 6 mm above the base of the corolla, their base dilated and pubescent, just as the corolla inside below their place of insertion. Ovary conical, glabrous; style filiform, about 18 mm long; stigmas globular, papillose. Capsule 2.5—3 cm in diam., with thick leathery operculum (upper part of exocarp) and scarious endocarp; seeds black, opaque, with 2 pilose-papillose edges, further glabrous, 7 mm long.

MALAY PENINSULA, Negri Sembilan, Bukit Dusun Paya, ALVINS 1181, March 1885 (S).

JAVA, Batavia, Bidaratjina, S. of Meester Cornelis, EDELING? s.n. (B); Weltevreden, Goenoeng Sahari Sentiong, 10 m, in thickets, 1 specimen, BACKER 33472, Aug. 1904 (B); Buitenzorg, Tji Sèng, Koeripan, N.W. of Buitenzorg, 125 m, on limestone rock, many specimens, BACKER 25471, July 1918 (B); cult. in the Botanical Garden, Buitenzorg, n. B. XIII. 2, from Tandjong Priok (according to HALLIER, 1896).

CELEBES, Celebes and Dependencies, Palopo, 200 m, KJELLBERG 1957, July 1929 (B).

FLORES, Mborong, 10—50 m, edge of forest, Mrs. RENSCH 1454, July 1927 (BD, mixed with *Ipomoea alba* L.).

TIMOR, without precise locality, without collector's name (ZIPPELIUS), numbered 45/6 (L, named *Convolvulus platypetalus* ZIPP.); id., LESCHENAULT, a specimen with very narrow leaves (P, named *Convolvulus petaloideus* CHOISY var. *linearifolia* in CHOISY's handwriting).

WETAR, TREUB 543, Sept. and Oct. 1893 (B).

MOLUCCAS, Boeroe, RIEDEL, type of *Ipomoea Riedeliana* OLIV. (according to OLIVER, 1883); Kay-islands, JAHIERI 172 (B).

NEW GUINEA, Papua, Lake Daviumbu, Middle Fly River, in secondgrowth rainforest, BRASS 7719, Sept. 1936 (L).

PHILIPPINE ISLANDS, according to MERRILL, 1923, in Luzon (Ilocos Norte, Union, Bataan, Rizal), in thickets and secondary forests at low altitudes; Luzon, prov. of Ilocos Norte, Bangui, RAMOS, Bur. of Sc. 2796, Febr.-March 1917 (B, K); prov. of Union, Bauang, ELMER 5622, Febr. 1904 (B, BD, L); prov. of Rizal, without precise locality, RAMOS, Bur. of Sc. 22470, March 1915 (B, K, L); id., Antipolo, RAMOS, Bur. of Sc. 2078, Jan. 1914 (B, BD, L, P, S); id., Montalban, MERRILL 5040, March 1906 (BD, L); id., Montalban, ROBINSON, Bur. of Sc. 9658, Jan. 1910 (L); id., Novaliches, LOHER 4156, Febr. 1891 (according to MERRILL and ROLFE, 1908); id., id., LOHER 4140, March 1891 (K); Cebu, RAMOS, Bur. of Sc. 11103, March 1912 (L, S).

Distribution: Indo-China (?), Malay Archipelago, New Guinea, Philippines.

Vernacular names: kangkong bukit (Malay Peninsula, ALVINS); bulakán-dápat (Philipp.: Tagalog language, MERRILL).

Use: "The leaf is made into poultice and applied to the head in cases of jungle fever" (ALVINS, Malay Peninsula).

Remarks. 1. Concerning the synonymy of this species one can give the following remarks. *a. Convolvulus bufalinus* LOUR. is a name the application of which is uncertain and must, therefore, be rejected. It has been described by LOUREIRO in his *Flora Cochinchinensis*, but the description is so short and incomplete that it is impossible to decide what species LOUREIRO had before him. *b. The name Ipomoea bufalina* (LOUR.) CHOISY is based wholly on *Convolvulus bufalinus* LOUR. and must, therefore, be rejected. *c. The next synonym Convolvulus platypeltis* ZIPP.

ex SPANOGHE is a name published as a synonym. *d. Ipomoea Riedeliana* OLIV. has been validly published and is the basis of our new combination.

2. Some authors (MIQUEL, BOERLAGE) misinterpreted this species as being identic with *Ipomoea petaloidea* CHOISY (= *Convolvulus crispatus* WALL.). Through the kindness of Prof. HOCHREUTNER I had the opportunity to study the type of CHOISY, a specimen collected by WALLICH and published by this author in his Catalogue (1828) n. 1403 as *Convolvulus crispatus* WALL., a nomen nudum. From this examination it became evident that we have to do here with a distinct species. By the absence of fruits it was, however, at first sight impossible to decide if we had to do with a species of *Merremia* or of *Operculina*. Fruiting specimens which were received on loan from the Kew herbarium by the kindness of Sir ARTHUR W. HILL, threw light on the question. It is now quite certain that *Ipomoea petaloidea* CHOISY is an *Operculina*, for which the right name must be *Operculina petaloidea* (CHOISY) VAN OOSTSTR.<sup>1)</sup>

CHOISY himself confounded the two species too, as he mentioned a specimen of LESCHENAULT from Timor as being identic. This specimen belongs to *Operculina Riedeliana* (OLIV.) VAN OOSTSTR.

Differences between *O. Riedeliana* (OLIV.) VAN OOSTSTR. and the type of *O. petaloidea* (CHOISY) VAN OOSTSTR.:

*O. Riedeliana* is an entirely glabrous twiner (with exception of the corolla); it has the stems stout and terete or very slightly striate; the peduncles are as thick as the stems or slightly thinner; the leaves have thin and slender petioles; the pedicels are rather thick and clavate upwards, much thickened in fruit; the sepals are orbicular, mucronulate, 13—17 mm long, in fruit to 20 mm long, the outer ones leathery, the cup-shaped calyx has a diam. of 3—3.5 cm in fruit; the corolla is 4—5 cm long; the capsule is 2.5—3 cm in diam., with a large operculum; the seeds are 7 mm long.

In the type-specimen of *O. petaloidea* the stems are generally more distinctly striate, or very narrowly alate below the nodes, pubescent and glabrescent; the peduncles are less thick and densely pubescent; the

<sup>1)</sup> *Operculina petaloidea* (CHOISY) VAN OOSTSTR., nov. comb. — *Convolvulus crispatus* WALL., Cat. (1828) n. 1403, nomen nudum — *Ipomoea petaloidea* CHOISY in Mém. Soc. Phys. Genève VI (1833) p. 451, excl. specim. Timor. — *Merremia petaloidea* (CHOISY) BOERL., Handl. Fl. Ned. Ind. II (1899) p. 509, quoad nomen tantum — *M. crispata* (WALL.) PRAIN, Bengal Pl. II, p. 730.

petioles are thicker and less slender, in adult leaves with narrowly winged, undulate margins at both sides above; the pedicels are thinner, gradually thickened upwards and pubescent; the sepals are narrower, elliptic, mucronulate, 13—15 mm long, thinner and less coriaceous. Well-developed corollas and fruits are lacking in the type-specimen (see below). The leaves of the type of *O. petaloidea* are narrow-ovate to oblong, the young upper ones narrow-oblong to lanceolate; the base is rounded or truncate to slightly emarginate, the apex, as far as present, is obtuse and mucronulate; the young leaves are densely pubescent below, very slightly pubescent to glabrous above; later on the pubescence on the lower surface is much more sparse or it completely disappears. In *O. Riedeliana* the leaves are always entirely glabrous, moreover they are mostly much broader, broad-ovate to orbicular, broadly to slightly cordate at the base and more or less abruptly acuminate at the apex.

Some specimens of *O. petaloidea* in the Kew herbarium bear ripe fruits enveloped by the slightly enlarged, to 17 mm long, sepals; the capsules are smaller than in *O. Riedeliana*, they have a diameter of about 1.5 cm; the seeds are 5—6 mm long.

#### XV. DECALOBANTHUS VAN OOSTSTR.

VAN OOSTSTR. in Blumea II (1936) p. 99 and 100, fig. 1.

Plant herbaceous, glabrous, stems prostrate, slender. Leaves ovate, attenuate towards the apex, truncate or slightly retuse at the base. Inflorescences axillary, pedunculate, 1- or 2-flowered; pedicels somewhat angular, slightly thickened at the apex. Sepals large, all of the same length or the exterior ones a little shorter, ovate or elliptic, obtuse or slightly emarginate. Corolla salver-shaped, the tube fleshy, long and narrow obconical or cylindrical, attenuate to the base, nerveless; limb 5-lobed, the lobes reflexed (or patent?), small, bifid, the middle part of them thicker than the oblong, obtuse membranaceous lobules. Stamens inserted in the corolla tube, anthers oblong or ovate, sagittate at the base, filaments flattened, gradually broadened to the base. Pollen smooth. Ovary glabrous, 2-celled, the cells 2-ovuled; style filiform, entire; stigmas 2, globose, papillose. Disk cylindrical, slightly lobed. Fruit unknown.

Only one species in Malaysia:

*Decalobanthus sumatranus* VAN OOSTSTR. in Blumea II (1936) p. 99 and 100, fig. 1.

Herbaceous, glabrous, stems prostrate, terete, fistulose, 1—2 mm thick. Leaves petiolate, petiole shorter than the blade, 10—17 mm long;



blade ovate or narrow-ovate, gradually attenuate towards the obtusish, mucronulate apex, truncate or slightly retuse at the base, 4—6 cm long, 2—4 cm broad, more or less shining above, paler beneath than above; the midrib and 6—7 nerves on each side of it prominent on both sides, secondary nerves about parallel, tertiary nervation reticulate. Inflorescences axillary, 1—2-flowered, peduncles striate or angular, 1.5—3.5 cm long; pedicels slightly angular, thickened at the apex, 10—15 mm long. Sepals to 19 mm long, all of the same length or the exterior ones a little shorter, concave, 2 exterior ones ovate, slightly emarginate, indistinctly mucronulate, coriaceous; 3 interior ones elliptic, slightly emarginate, indistinctly mucronulate, coriaceous, scarious at the margin. Corolla yellow, salver-shaped, the tube long and narrow obconical or cylindrical, attenuate to the base, fleshy, to 2.5 cm long, the limb 5-lobed, the lobes small, reflexed (or patent?), bifid, the middle part of them thicker than the oblong, obtuse, slightly unequal, about 5—5.5 mm long, striate lobules. Filaments about 5 mm long, flattened, gradually broadened towards the base, glabrous or papillose in the basal part, inserted about 6.5 mm above the corolla base; anthers oblong or ovate, 6 mm long, shortly sagittate at the base. Ovary 2-celled, conical, glabrous; each cell with 2 ovules. Style filiform, to 16 mm long; stigmas 2, globose, papillose. Disk cylindrical, 1.25 mm high, slightly lobed. Fruit unknown.

SUMATRA, Djambi, near Bangko, along road to Kerintji, 60 m, open sunny place on weathered tuff, July 1925, POSTHUMUS 571 (B, *type*).

Distribution: Sumatra.

Vernacular name: Akar tanah (Djambi, POSTHUMUS).